

Chapter 2

Public Participation, Existing Development and Alternatives

2.1 INTRODUCTION

The purpose of this chapter is to provide an overview of the public participation process, to describe the existing development, and to present alternatives for continued exploration, development, and production of natural gas resources in the PAPA. The project components associated with Alternative A (No Action Alternative), Alternative B (Proposed Action Alternative), and Alternative C are summarized in this chapter. Other project alternatives considered, but not analyzed in detail, are also discussed in this chapter. This chapter describes the expansion of transportation corridors, proposed gas sales pipelines from the PAPA to gas processing plants in southwestern Wyoming, and expansion of the Granger Gas Processing Plant.

2.2 PUBLIC PARTICIPATION

2.2.1 Scoping, Consultation and Coordination

NEPA regulations (40 CFR 1500–1508) require BLM to use a scoping process to identify potential significant issues in preparation for impact analysis. The principal goals of scoping are to allow public participation and to identify issues, concerns, and potential impacts that require detailed analysis. Scoping was the primary mechanism used by the BLM to identify concerns regarding proposed development in the PAPA.

A number of meetings/announcements involving the BLM, the Operators, various agencies, and the public have been held to encourage early and improved public participation and agency cooperation. The BLM's Notice of Intent (NOI) to prepare a Supplemental EIS inviting the public to comment on the Operators' proposal for long-term development of the PAPA appeared in the Federal Register on October 21, 2005. BLM mailed a scoping notice to the media, governmental agencies, environmental organizations, industry representatives, individuals, landowners, and livestock grazing permittees. The scoping notice explained the general nature of the project and requested comments. The formal public scoping comment period ended November 20, 2005. Scoping meetings were held in Jackson and Marbleton on November 7, 2005, and in Pinedale on November 8, 2005.

The locations of the proposed transportation corridor/pipeline alignments were not determined at the time of the initial scoping; therefore, an additional scoping notice was mailed. The second notice, mailed on April 14, 2006, was sent to the same recipients as the October 2005 scoping notice, and also individuals and organizations on mailing lists associated with the BLM Rock Springs and Kemmerer field offices. The formal public comment period for the second scoping notice ended on May 17, 2006.

Numerous concerns were identified through the formal scoping process. Comments received during scoping were incorporated into the analysis and are available for inspection in BLM's Pinedale, Kemmerer and Rock Springs field offices. The agencies and government entities that were consulted in the scoping process include the WGFD, U.S. Fish and Wildlife Service (FWS), USFS, National Park Service (NPS), Environmental Protection Agency (EPA), the State of Wyoming, Sublette County, and the BLM Interdisciplinary Team (ID Team). The concerns identified are summarized below in Section 2.2.2 and are detailed in Appendix B.

The BLM ID Team considered all comments received during the scoping process. From the breadth of key environmental concerns submitted by agencies and the public, the ID Team developed alternatives that are described in later sections of this chapter. The comments provided guidance for analysis of impact to each resource addressed in Chapters 3 and 4.

2.2.2 Summary of Concerns

Following the November 2005 scoping, BLM received a total of 63 written comments, nine of which were from government agencies (two federal, five state, and two county), four from industry representatives, five from environmental organizations, and 45 from private individuals. Following the April 2006 scoping of the proposed transportation corridor/pipeline alignments, BLM received a total 10 written comments. Five of the comments were from government agencies (three federal, one state, and one county) and five were from private individuals.

Concerns introduced by the public, industry, interested groups, and other agencies are summarized below:

- The pace of development in the PAPA is too fast and BLM has not fully evaluated the environmental consequences of winter drilling, operators' mitigation, compliance with all regulatory standards, and application of adaptive management;
- BLM should analyze an alternative that emphasizes conservation and wildlife in the PAPA;
- The impact to wildlife by current development has been a major concern. Although monitoring must continue, new approaches to mitigation should be developed and monitored;
- The effects on livestock operators and private landowners by wildlife displaced due to development in the PAPA should be evaluated on-site and off-site, and mitigation should be proposed;
- Winter drilling will increase winter traffic and cause increased safety risks;
- The effect of winter drilling on the economic stability in Sublette County over the long-term should be evaluated;
- Industrialization on public and private lands has become a single resource use of land, not multiple use;
- Hunting is impacted by declining wildlife populations;
- Wellfield development is impacting surface water and groundwater; and
- Air quality in the region should be fully evaluated with respect to sensitive airsheds and local air quality, and mitigation measures should be proposed, where necessary.

2.3 EXISTING DEVELOPMENT WITHIN THE PAPA

Many of the written responses to scoping referred to concerns about the existing development in the PAPA. The extent of the existing development in the PAPA together with the approved components in the PAPA ROD (BLM, 2000b) provides the baseline for evaluating each alternative described in Section 2.4. The analyses and discussions that follow provide a current inventory of natural gas development since the PAPA ROD was issued.

In addition to the extent of development, respondents to scoping focused on the pace of development in the PAPA. The number of wells drilled and completed during any given year is

the pace of development. The amount of gas produced is more reflective of market conditions, which might result in conditions favorable for an Operator to increase the pace of development. The number of producing wells at the end of 2001, the first full year after the PAPA ROD was issued, was 38; at the end of 2005 there were approximately 457 producing wells. Natural gas production in 2005 was approximately 12 times greater than production in 2001 (Table 2.3-1). Condensate and water production have also increased each year in the PAPA.

Table 2.3-1
Total Annual Production of Natural Gas,
Condensate, and Produced Water in the PAPA Since 2000

Year	Natural Gas (MCF)	Condensate (Bbls)	Produced Water (Bbls)
2000	8,195,121	78,621	118,018
2001	14,946,294	143,378	193,261
2002	41,909,699	376,726	476,903
2003	80,504,011	649,687	1,434,565
2004	136,329,573	1,075,210	2,876,604
2005	179,160,224	1,407,162	4,167,555
Source: Wyoming Oil and Gas Conservation Commission			

While the level and rate of development in the PAPA is much greater than predictions in the PAPA DEIS (BLM, 1999a), it is not unusually high for an emerging gas field. Since approval of the PAPA ROD (BLM, 2000b), better definition of the resource places the Pinedale Anticline Field as the third largest natural gas field in the nation (WOGCC, 2006).

2.3.1 Limitations in the PAPA ROD

2.3.1.1 Project Components

The PAPA ROD (BLM, 2000b) authorized project components on BLM administered federal lands and minerals within the PAPA (see Table 2.3-2). The PAPA ROD (BLM, 2000b) stated that authorized development beyond the specified levels would require additional supplemental environmental impact analysis. For all analyses of impacts in this Draft SEIS, activities proposed for 2006 are included within the existing environmental baseline because development is ongoing during 2006 while this document is being prepared. Wellfield components authorized by the PAPA ROD, and summarized in Table 2.3-2, will not reach the threshold limits on development before the end of 2006.

Table 2.3-2
PAPA ROD Approved Components Compared to Development since the PAPA ROD¹

PAPA ROD Approved Component	Number	Development (July 2000 through December 2005)	Projected Development During 2006	Estimated Total Development Through 2006
initial well pad locations on all lands and minerals within the PAPA	900 well pads	266 well pads	26 well pads	292 well pads
producing wells and/or well pads on all lands and minerals within the PAPA	700 wells or well pads ²	428 wells	205 wells	633 wells
production facilities at individual well locations	700	Less than 431	Less than 205	Less than 636
central off-site production facilities	None specified	none	none	none
compressor facility sites	4	3	none	3
BP Amoco Field Office	1	none	none	none

PAPA ROD Approved Component	Number	Development (July 2000 through December 2005)	Projected Development During 2006	Estimated Total Development Through 2006
miles of sales pipeline corridor for multiple pipelines	121.5	14.5 (within the PAPA)	none	14.5 (within the PAPA)
miles of access road (including collector, local and resource roads)	276.0	176.5	6.7	183.2
miles of gathering pipeline system	280.0	134.2	7.4	141.6
¹ Totals do not include 56 well pads constructed and 29 producing wells drilled before July 2000.				
² See Section 1.3 in Chapter 1 for discussion on ambiguity of PAPA ROD regarding well and well pads.				

2.3.1.2 Management Area Well Pad Thresholds

BLM's Preferred Alternative (*Resource Protection Alternative on Federal Lands and Minerals*), developed in the PAPA DEIS (BLM, 1999a) and authorized by the PAPA ROD (BLM, 2000b), was implemented through restrictions on exploration and wellfield development within each of nine MAs. Section 4 of the PAPA ROD provided specific limits of development within each of the nine MAs based on numbers of producing well pads. The PAPA ROD specifies that if well pad density limits are reached for a MA, additional environmental analysis would be required. Management objectives for each MA were developed in the PAPA DEIS (BLM, 1999a) and authorized in the PAPA ROD.

The largest single area of development since the issuance of the PAPA ROD (BLM, 2000b) is well pad construction in MA 5 - *Big Game Winter Range and Sage Grouse Strutting and Nesting Habitat* (Table 2.3-3), with an estimated 129 well pads at the end of 2006. The highest density of pads is within MA 9 - *Non-Federal Lands* in Section 16, T. 32 N., R. 109 W., a state owned section surrounded by federal lands in MA 5.

**Table 2.3-3
Management Area Limitations and Current Status of Well Pads**

Management Area Limitations for Resource Protection in the PAPA ROD	Estimated Current Status of Well Pad Limitation July 2000 through 2006
MA 1 - Lander Trail	
total producing pads threshold	0 total producing pads
MA 2 - Mesa Breaks	
0 total producing pads threshold	0 total producing pads
MA 3 - Unleased Federal Minerals	
0 total producing pads threshold	0 total producing pads
MA 4 - Sensitive Viewshed	
28 total producing pads threshold	5 total producing pads
MA 5 - Big Game Winter Range and Sage Grouse Strutting and Nesting Habitat	
212 total producing pads threshold	129 total producing pads
MA 6 - Sage Grouse Strutting and Nesting Habitat	
183 total producing pads threshold	45 total producing pads
MA 7 - Ross Butte/Blue Rim	
68 total producing pads threshold	30 total producing pads
MA 8 - Minimal Conflict Area	
168 total producing pads threshold	32 total producing pads
MA 9 - Non federal Lands¹	
200 total producing pads threshold	51 total producing pads
¹ BLM does not have jurisdiction on non-federal lands.	

Currently, none of the thresholds for well pads in the individual MAs has been reached. *Big Game Winter Range and Sage Grouse Strutting and Nesting Habitat* (MA 5) and *Ross Butte/Blue Rim* (MA 7) are the most developed with approximately half of the allowable well pads constructed. For MA 5, 129 pads have been constructed out of 212 allowable well pads, and 30 well pads have been constructed of the 68 pads allowed in MA 7.

2.3.1.3 Air Quality Analysis Threshold

Since the PAPA ROD (BLM, 2000b) was issued, natural gas development within the PAPA has occurred at a faster pace than was analyzed in the PAPA DEIS (BLM, 1999a). The PAPA ROD specified a threshold for emission analysis levels of 376.59 tpy of NO_x from compression, and 693.50 tpy of NO_x from all sources in the field. The PAPA ROD states that if these analysis levels are exceeded, additional analysis would be conducted. The air quality impact assessment modeling for the PAPA DEIS assumed 900 initial wells drilled, with 700 producing wells and up to eight drilling rigs operating in the PAPA at any one time. As of December 2005, there were 457 producing wells and 26 drilling rigs operating in the PAPA. However, of the 457 producing wells, only 428 wells are subject to the analysis thresholds in the PAPA ROD because 29 producing wells were existing prior to issuance of the PAPA ROD. The Operators projected an additional 205 producing wells in 2006 for a total of 662 producing wells (633 subject to the analysis thresholds in the PAPA ROD). Subsequent NEPA analysis (BLM, 2004a) disclosed that the NO_x emissions from all sources in the PAPA had exceeded the 693.50 tpy analysis threshold specified in the PAPA ROD, mostly due to the increased number of drilling rigs.

2.3.2 Surface Disturbance by Wellfield Component

Total surface disturbance, by wellfield component, through December of 2005 was determined from digitized QuickBird Satellite Imagery (resolution of 0.6 meter, digitized at a scale of 1:2,000). Well pads with a variety of features (wellheads, pits, tank batteries) were clearly visible on the imagery as were roads and pipelines. When the digitized wellfield disturbance was compared with ground truth, revegetated and nonvegetated areas were not consistently distinguishable. Some portions of well pads and pipelines identified as revegetated in the imagery were found to be newly disturbed. Therefore, all portions of well pads, roads, and pipelines were assumed to be disturbed. Map 2.3-1 shows the existing natural gas related disturbance in the PAPA as of December 2005, including areas disturbed before issuance of the PAPA ROD (BLM, 2000b).

Disturbance in 2006 has been projected by the Operators and is not shown on Map 2.3-1. Table 2.3-4 provides the total estimated disturbance in the PAPA as a result of natural gas development through 2006 (5,059 acres). However, only disturbance that has occurred since July 2000 is subject to the limits in the PAPA ROD (BLM, 2000b) which is estimated to be 4,679 acres. Although the PAPA ROD did not place limits on total surface disturbance from wellfield activity, it did place limits on disturbance associated with roads and gathering pipelines in terms of lineal dimensions rather (miles) than area disturbed (acres). Most surface disturbance has been concentrated along the Anticline Crest (see Map 2.3-1).

Map 2.3-1
Existing Wellfield Disturbance
Through 2005

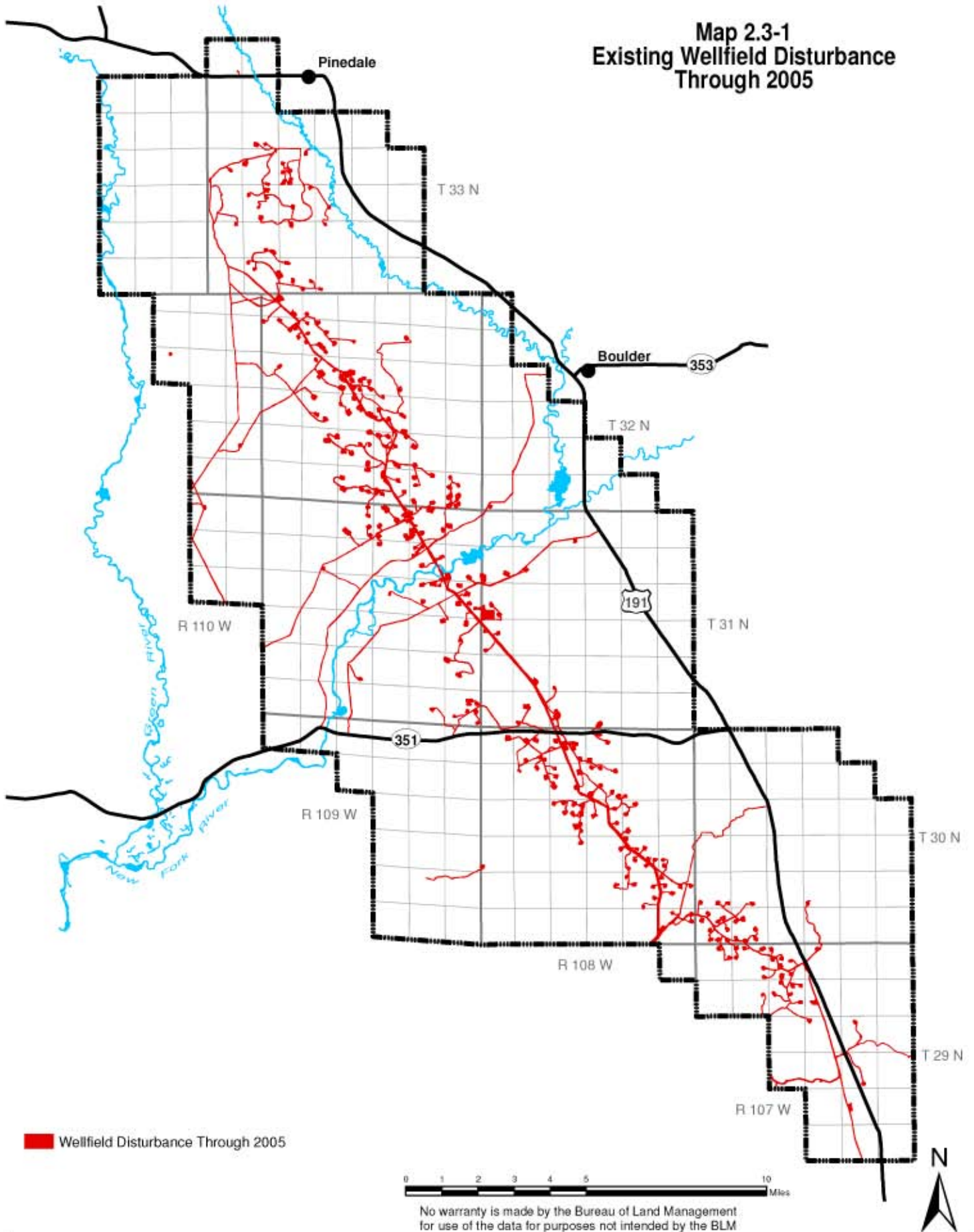


Table 2.3-4
Estimated Total Surface Disturbance in the PAPA
as a Result of Natural Gas Development through 2006

Wellfield Component	Number or Miles	Total Area Disturbed (acres)
Before PAPA ROD		
Well Pads	56 pads	332.1
Roads	32.7 miles	168.7
Gathering Pipelines	12.1 miles	60.2
Total		561.0
Since PAPA ROD		
Well Pads	266 pads	1,808.0
Roads	176.5 miles	913.0
Gathering Pipelines	134.2 miles	804.8
Sales Pipelines	14.5 miles	437.9
Compressor Stations	3 sites	27.2
Stabilizer Facility	1 site	5.7
Anticline Disposal Facility	1 site	72.0
Yards	6 sites	48.9
Total		4,117.5
Proposed 2006		
Well Pads	26 pads	300.5
Roads	5.9 miles	30.7
Gathering Pipelines	7.9 miles	47.1
Compressor Station	1 site	2.6
Total		380.9
Grand Total		5,059.4

2.3.2.1 Well Pads

As of December 2005, there were 322 well pads in the PAPA, of which 56 were constructed before issuance of the PAPA ROD (BLM, 2000b); 266 well pads have been constructed since July 2000 (see Table 2.3-4). The Operators are projecting to construct 26 well pads in 2006, for a total of 292 well pads that would be subject to the limit of 700 producing well pads in the PAPA ROD. Therefore, the threshold for total well pads in the PAPA ROD will not have been reached by the end of 2006.

2.3.2.2 Roads and Gas Gathering Pipelines

Before issuance of the PAPA ROD (BLM, 2000b), there were 168.7 miles of road associated with natural gas development in the PAPA. The PAPA ROD approved additional construction and/or upgrade of access roads on BLM administered lands, including collector, local, and resource roads totaling approximately 276 miles. The roads in the PAPA are classified as follows:

- Arterial roads with high traffic volumes that pass through the PAPA such as state highways or county roads (not subject to limitations in the PAPA ROD);

- Two-lane collector roads that provide primary access to large blocks of land and connect with or extend the public road system;
- One or two-lane local roads that connect to collector roads but which normally serve a smaller area and convey less traffic than collector roads; and
- Single lane resource roads from individual well pads to local or collector roads.

Approximately 176.5 miles of local and resource roads have been constructed and/or improved since the PAPA ROD (BLM, 2000b) was issued. The Operators are projecting an additional 5.9 miles of road in 2006 (Table 2.3-5). Together, an estimated total of 182.4 miles of road in the PAPA are subject to the 276-mile limit in the PAPA ROD which includes upgrading roads on lands managed by BLM that were present before issuance of the PAPA ROD. The threshold for roads in the PAPA ROD will not have been reached by the end of 2006. Map 2.3-2 shows the existing road network in the PAPA.

Table 2.3-5
Existing Roads within the PAPA by Road Category

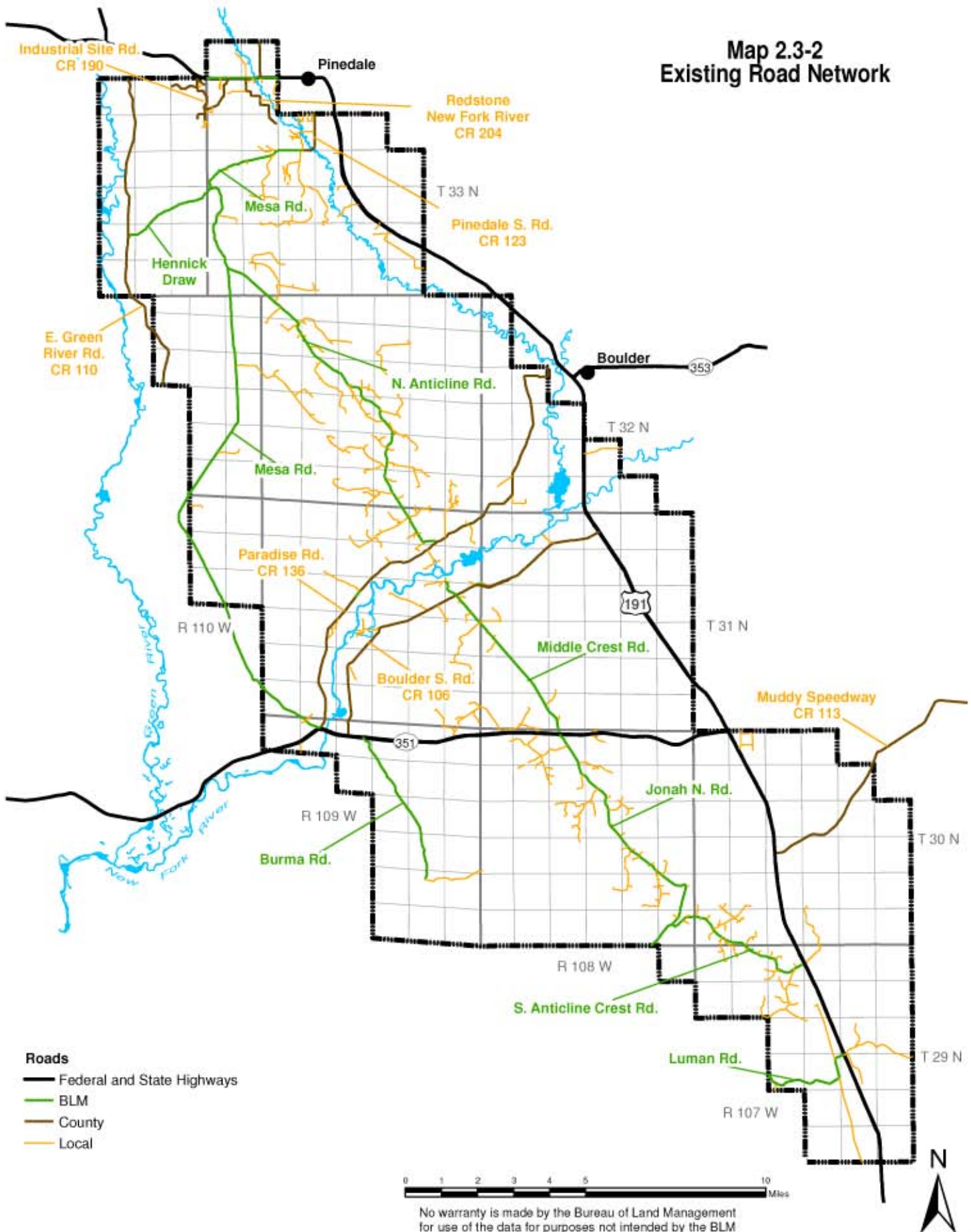
Road Category	Roads Constructed July 2000 through December 2005 Since the PAPA ROD		Projected Roads in 2006		Estimate of all Roads Existing in the PAPA Subject to PAPA ROD Limitations	
	Length (miles)	Disturbance (acres)	Length (miles)	Disturbance (acres)	Length (miles)	Disturbance (acres)
Arterial	0.0	0.0	0.0	0.0	0.0	0.0
Collector	64.1	396.5	0.0	0.0	64.1	396.5
Local	52.2	235.5	5.9	30.7	118.3	547.2
Resource	60.2	281.0				
Total	176.5	913.0	5.9	30.7	182.4	943.7

The PAPA ROD (BLM, 2000b) approved an additional 280 miles of gathering pipelines to carry natural gas from individual well pads to a central location where the gas would be compressed into a sales pipeline. The approval included construction and operation of 3- to 16-inch diameter gathering pipelines. Approximately 134.2 miles of gathering pipeline have been constructed between July 2000 and December 2005, with an additional 7.9 miles of gas gathering pipeline projected in 2006. The total of 142.1 miles of gathering pipeline is below the limit allowed by the PAPA ROD.

In 2005, Questar installed a condensate and produced water gathering system within their leaseholds in the northern portion of the PAPA. Potential environmental impacts for the gathering system were evaluated by BLM (2004a). The PAPA DEIS (BLM, 1999a) did not consider installation and operation of a liquid gathering system, or for transportation of these produced liquids from the PAPA to sales and disposal facilities. Therefore, the liquids gathering system is not considered part of the gathering pipeline limit set forth in the PAPA ROD.

2.3.2.3 Gas Sales Pipelines

The PAPA ROD (BLM, 2000b) approved a route, including two alternative alignments, with a 200-foot wide right-of-way to accommodate multiple gas sales pipelines. Depending on alternatives, the route ranged from 119.6 to 121.7 miles. The PAPA ROD approved a 121.5-mile route. Currently, a portion of the constructed gas sales pipeline extends for 14.5 miles within the PAPA with an estimated disturbance of 437.9 acres.



2.3.2.4 Compressor Stations

The PAPA ROD (BLM, 2000b) allowed for authorization of four compressor station sites within the PAPA. There are currently three compressor stations in the PAPA including the Pinedale/Gobblers Knob Compressor Station operated by QGM (Section 2, T. 31 N., R. 109 W.); and the Paradise Compressor Station (Section 2, T. 31 N., R. 109 W.), and the Falcon Compressor Station (Section 36, T. 30 N., R. 108 W), which are both operated by JGGC. Total compression for the three stations is 58,948 horsepower (hp) for the compressor engines, with an additional 7,690 hp associated with generators and vapor recovery units for a total of 66,638 hp.

As of December 2005, the three facilities covered 27.2 acres. The horsepower shown in Table 2.3-6 includes an expansion of the Pinedale/Gobblers Knob Compressor Station in 2006, with an additional 7,440 hp of compression and 2.6 acres of disturbance. The projected disturbance for the compressor stations in the PAPA by the end of 2006 is 29.8 acres. The total NO_x emission for all compression within the PAPA by the end of 2006 is 472.2 tpy.

**Table 2.3-6
Compressor Stations, Existing Horsepower with Corresponding
NO_x Emissions in the PAPA through 2006**

Station Name/Owner	Existing Compression (hp)	Existing Generation (hp)	Existing VRU (hp)	Total Compression (hp)	NO _x Emission (tpy)
Pinedale/Gobblers Knob	18,600 ¹	0	0	18,600 ¹	125.7
Paradise	18,340	3,600	245	22,385	161.2
Falcon	22,008	3,600	245	25,853	185.3
Total	58,948	7,200	490	66,638	472.2

¹ Includes 7,440 hp installed in 2006.

The PAPA ROD (BLM, 2000b) allowed for varying levels of compression, depending upon the compressor emissions rating, the level of construction and drilling activity, and the number of producing wells. The current level of 66,638 hp is within the amount of compression analyzed in the PAPA DEIS (26,000 to 96,000 hp with compressor emission ratings of 1.5 to 0.7 g/hp-hr, respectively). However, the total NO_x emission of 472.2 tpy is over the 376.59 tpy NO_x analysis threshold specified in the PAPA ROD.

2.3.2.5 Stabilizer Facility

Disturbance associated with the expansion of the Pinedale/Gobblers Knob Compressor Station for the stabilizer facility was analyzed under NEPA (BLM, 2004a) and included an additional 5.7 acres. QGM modified their plans to include a condensate stabilizer and water handling facility. The purpose of the condensate stabilizer is to make a “stable” product that can be metered and pumped to the crude petroleum pipeline for transport off the PAPA. The modification was analyzed under NEPA by BLM, and a Documentation of Land Use Plan Conformance and NEPA Adequacy, or DNA, was issued in 2005. It included installation of an underground 25 kV three-phase power distribution line to connect the condensate stabilizer to the Pinedale/Gobblers Knob Compressor Station.

2.3.2.6 Anticline Disposal Facility

The Anticline Disposal Facility, which disposes of produced water by evaporation and surface discharge (proposed to begin in 2007), is located in Section 18, T. 31 N., R. 108 W. and Section

13, T. 31 N., R. 109 W. The 72.0-acre site is located entirely on private land. BLM has issued rights-of-way for pipelines and roads to and from the facility.

2.3.2.7 Storage Yards

There are seven storage yards located within the PAPA that are located within various Operator leaseholds. The total surface disturbance for the storage yards is 49.0 acres.

2.3.3 Drilling Rigs

Restrictions on numbers of drilling rigs present at any time within the PAPA were not carried forward from the PAPA DEIS (BLM, 1999a) and the PAPA FEIS (BLM, 2000a) to the PAPA ROD (BLM, 2000b). BLM concluded that limiting the number of rigs (on federal and nonfederal lands and minerals, combined) would be difficult to manage. Furthermore, BLM noted that seasonal restrictions to protect wildlife under the Preferred Alternative (*Resource Protection Alternative on Federal Lands and Minerals*) would impose limits on numbers of rigs within specific MAs and would control numbers of rigs operating within the PAPA. Other factors, including, but not limited to, the availability of rigs and workers, market price of natural gas, and budgetary constraints, would contribute to limit drilling rigs working at any one time.

The number of drilling rigs operating in the PAPA has increased since issuance of the PAPA ROD (BLM, 2000b). In each year, the fewest rigs have been present between November and April, which corresponds with BLM's standard practice of not allowing activities or surface use from November 15 through April 30 within big game crucial winter ranges. There has been an increase in wells drilled and drilling rigs present each month during winter from 2003-2004, due to the exceptions granted by BLM and the Decision Records for several limited winter drilling proposals (BLM, 2004a, 2005a, 2005b, and 2005c).

Based on available data (RigData, 2006), drilling rigs averaged 62 days to drill wells to depths averaging 13,600 feet. There is considerable variation in the average amount of drilling time and bottom-hole depth, regardless of which geologic formation was targeted. Efficiency improves as more wells are drilled, and the Operators have estimated that most wells could be drilled within 50 days. The deepest well to date was drilled to a depth of 19,520 feet, is completed to the Lance Pool, and is in the production phase. All of the deeper intervals were tested and they produced uneconomic quantities of natural gas.

2.3.4 Other Approved Components

Production Facilities. The PAPA ROD (BLM, 2000b) authorized up to 700 production facilities on individual well pad locations. Production facilities include tanks, separators, dehydration units, remote telemetry, and other equipment. Most of the well pads with producing wells have dedicated production facilities, although, some production facilities are shared.

Central/off-site production facilities (C/OSPF's) were envisioned in the PAPA ROD (BLM, 2000b) for efficient operation of wells and/or to avoid or minimize disturbance to sensitive resources (wildlife, sensitive viewsheds, etc.) on 80- and 40-acre well spacing. The PAPA ROD allowed for authorization of C/OSPF's on a case-by-case basis. Directional drilling one or more wells from a single pad was also envisioned and could be authorized on a case-by-case basis. Currently, there are no C/OSPF's within the PAPA, although there has been extensive directional drilling since July 2000.

Water Wells. The PAPA ROD (BLM, 2000b) allowed for authorization of surface water and/or water supply wells drilled on gas well pads as water sources for drilling, completions, pipeline hydrostatic testing, and dust abatement. There were no limits placed on the number of water supply wells in the PAPA ROD, and there are approximately 98 Operator-drilled water wells

being monitored in the PAPA. Well depths range from 120 to 1,040 feet averaging 638 feet. Most of the Operator-drilled water wells are on gas well pads.

Field Office. Another authorized component is the BP Amoco Field Office that was proposed to be located on a 5-acre site in SW ¼ Section 23, T. 29 N., R. 107 W. The field office has not been constructed.

Central Delivery Points. In 2005, QGM constructed three Central Delivery Point (CDP) facilities within Questar's leasehold, all of which were constructed on existing pads within existing disturbance. The purpose of the CDPs is to receive condensate, produced water, and natural gas from producing wells. The three CDPs were located on existing pads within existing disturbance at Mesa 15-06, Stewart Point 16-18, and Mesa 14-16 well pads. Impacts associated with construction and operation of the CDPs on federal surface were analyzed under NEPA, and Categorical Exclusions (CXs) were issued. The CDP located on the Mesa 14-16 well pad is on a state lease. An underground 25 kV three-phase power distribution line to the CDPs was analyzed and was installed in 2005.

Water Handling Facility. QGM proposed to install a water storage facility near Highway 351. Impacts associated with the emergency tank storage facility were analyzed under NEPA by BLM, and an EA was issued; however, the facility was not constructed.

2.4 ALTERNATIVES

This section briefly discusses the alternatives analyzed in detail in the PAPA DEIS (BLM, 1999a), introduces the alternatives analyzed in detail in this Draft SEIS, and presents alternatives considered, but not analyzed in detail.

2.4.1 Alternatives Analyzed in the PAPA DEIS

The PAPA DEIS (BLM, 1999a) analyzed three action alternatives; the *Standard Stipulation Alternative*, the *Resource Protection Alternative on Federal Lands and Minerals*, and the *Resource Protection Alternative on All Lands and Minerals*.

2.4.1.1 Standard Stipulation Alternative

This alternative assumed that either 500 or 700 producing well pads would be developed entirely under BLM's Standard Mitigation Guidelines (Appendix A of the PAPA DEIS), with lease stipulations on development issued at the time of leasing. Impact analysis was based on an average of up to eight drilling rigs operating within the PAPA year-round. Unless required by lease stipulations, the *Standard Stipulations Alternative* generally did not limit the density of development (the number of potential well pad locations per section) within any of the SRMZs. In most cases, the alternative addressed anticipated impact from locating up to 16 well pads per section in each of the SRMZs.

2.4.1.2 Resource Protection Alternative on Federal Lands and Minerals

This alternative analyzed the impacts of implementing the *Resource Protection Alternative* on only Federal Lands and Minerals. This alternative assumed that either 500 or 700 well pads would be developed using BLM's Standard Mitigation Guidelines and lease stipulations. It disclosed the types of impacts that would remain even if BLM implemented additional controls to reduce undue impacts. It evaluated the benefits of slower paced development by limiting the number of rigs operating annually in the PAPA to five. Finally, the alternative addressed the application of pad drilling and centralized production facilities as additional mitigation measures. This alternative considered pad drilling as an option for reducing surface disturbance and human presence in the PAPA. The term refers to multiple wells with different bottom-hole

locations directionally drilled from a single surface well pad. Use of centralized production facilities was advanced in this alternative to eliminate storage of condensate and produced water on each well pad, collecting them at central locations. This alternative, as modified in the PAPA ROD (BLM, 2000b), was implemented by BLM.

2.4.1.3 Resource Protection Alternative on All Lands and Minerals

This alternative analyzed the impacts of implementing the *Resource Protection Alternative* throughout the PAPA (on all lands and minerals). This alternative assumed that either 500 or 700 well pads would be developed using BLM's Standard Mitigation Guidelines and lease stipulations. The implementation of mitigation measures (pad drilling and centralized production facilities) on all lands in the PAPA was evaluated.

2.4.2 Alternatives Analyzed in Detail

The No Action Alternative (Alternative A), the Proposed Action Alternative (Alternative B) and Alternative C, are analyzed in detail in this Draft SEIS. The No Action Alternative is analyzed through 2011. The Proposed Action (Alternative B) and Alternative C are analyzed through 2023 with intermediate analyses in 2011. There are project components that are common to all alternatives and are discussed below.

2.4.2.1 Components Common to All Alternatives

Transportation Requirements. The number of vehicles in and out of the PAPA on a daily basis varies seasonally. During the development period (through 2011 for the No Action Alternative and 2023 for the Proposed Action and Alternative C) and production period (through 2051 for the No Action Alternative and 2065 for the Proposed Action and Alternative C), traffic would be much greater in summer than in winter, due to traffic required for construction of roads, pads and pipelines. Workers, material, and equipment would be transported to the PAPA over U.S. Highways 191 and 189, State Highway 351, and county and BLM roads located within the PAPA. A comparison of traffic requirements for each of the alternatives for 2009 with and without the proposed liquid gathering system is provided in Table 2.4-1 below. A Transportation Plan developed by some of the Operators for the Proposed Action Alternative is provided in Appendix C.

Table 2.4-1
Comparison of Traffic (vehicles per day) During Development for all Alternatives in 2009

	No Action Alternative			Proposed Action Alternative and Alternative C		
	Light	Heavy	Total	Light	Heavy	Total
Summer	1,959	1,034	2,993	622	595	1,217
Winter without gathering	1,589	665	2,254	N/A	N/A	N/A
Winter with gathering	N/A	N/A	N/A	521	443	964

Workforce Requirements. The estimated workforce requirements provided by the Operators to develop a single well in the PAPA are provided in Table 2.4-2.

Table 2.4-2
Workforce Requirements Necessary to Develop a Single Well in the PAPA

Category	Average Number of Workers	Average Number of Days
Well Pad and Access Road Construction	15	5
Rig Up/Down	15	5
Drilling	25	50
Testing and Completion	20	12

Mitigation Requirements. BLM would incorporate environmental Best Management Practices (BMPs) into the APD Surface Use Plan of Operations by the Operator under all alternatives. BMPs are provided in *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development* – a joint effort by DOI and USDA (2006), also known as the Gold Book.

Pipeline Corridors. The BLM proposes the designation of three pipeline corridors to support construction and operation of future pipelines for transport of natural gas related production (natural gas, crude petroleum and produced water) from the PAPA (see Map 2.4-1). The corridors would mostly parallel, and be located adjacent to, existing pipeline corridors connecting the PAPA with natural gas processing plants in southwestern Wyoming. The BLM has determined the need for such corridors based on:

- continued success in the development of natural gas resources in the PAPA;
- indications, initial plans, and actual proposals by industry for the construction and operation of additional pipeline capacity to transport the increasing volumes of natural gas and other hydrocarbon products from the PAPA and Jonah Field Project Area to market;
- an agency determination that the existing pipeline corridors are full; and
- provisions of the 2005 Energy Policy Act encouraging location of pipelines in common corridors and providing for expedited NEPA approvals.

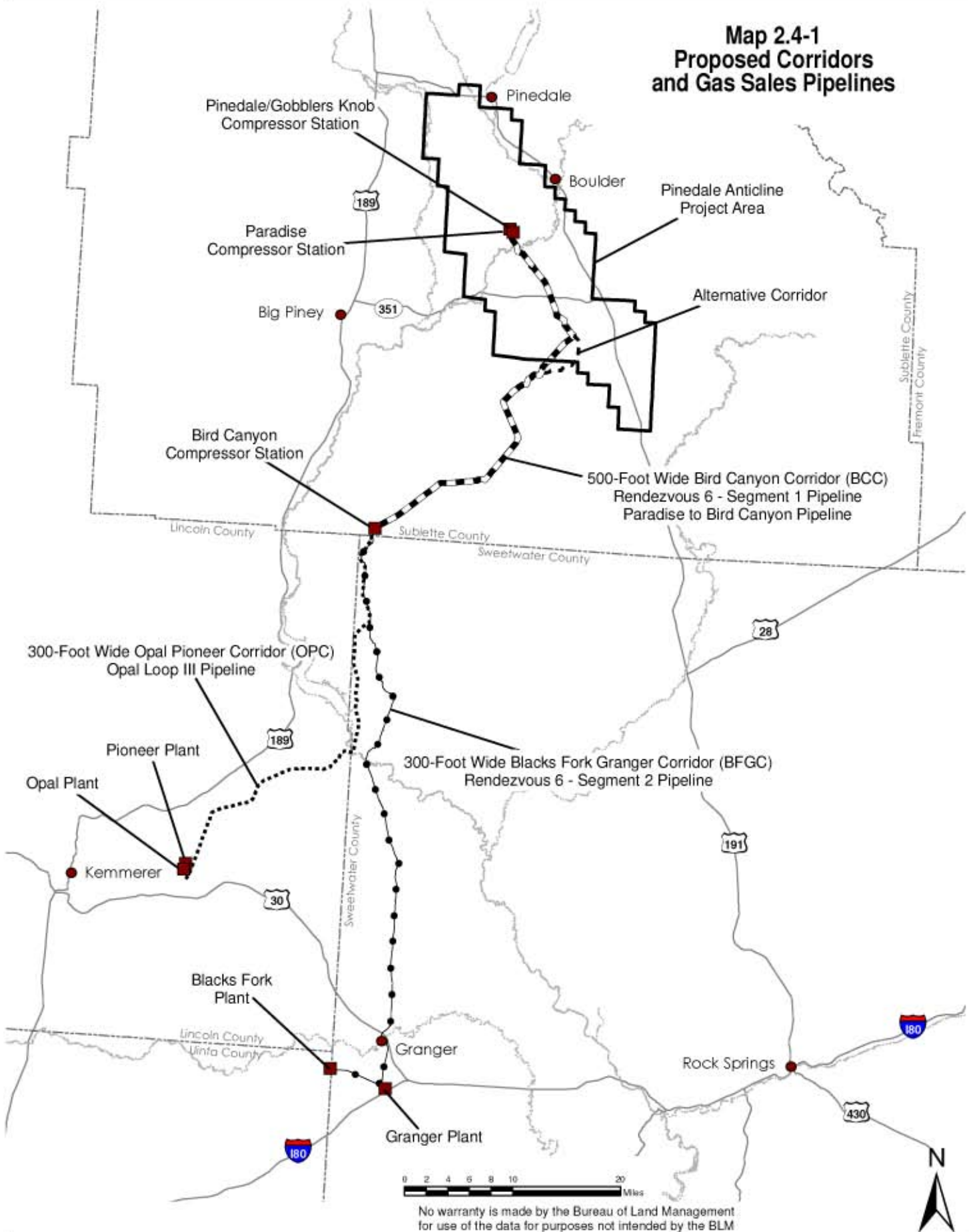
The proposed pipeline corridors are discussed below:

1. The 500-foot wide, 41.5-mile long Bird Canyon Corridor (BCC) would mostly parallel and be adjacent to the existing 200-foot wide pipeline corridor between the PAPA (Pinedale/Gobblers Knob and Paradise compressor stations, Section 2, T. 31 N., R. 109 W.) and the Bird Canyon Compressor Station (Section 34, T. 27 N., R. 111 W.)
2. The 300-foot wide, 62.1-mile long Blacks Fork Granger Corridor (BFGC) would mostly parallel and be adjacent to the existing 200-foot wide pipeline corridor between the Bird Canyon Compressor Station and the Blacks Fork Gas Processing Plant (Section 10, T. 18 N., R. 112 W.) with an intermediate connection into the Granger Gas Processing Plant (Section 16, T. 18 N., R. 111 W.).
3. The 300-foot wide, 45.5-mile long Opal Pioneer Corridor (OPC) would mostly parallel and be adjacent to the existing 200-foot wide pipeline corridor between the Bird Canyon Compressor Station and the Opal Gas Processing Plant (Section 27, T. 21 N., R. 114 W.) with an intermediate connection into the Pioneer Gas Processing Plant (Section 22, T. 21 N., R. 114 W.).

Of the 41.5 miles of proposed BCC between the adjacent Pinedale/Gobblers Knob and Paradise compressor stations and the Bird Canyon Compressor Station, approximately 20.2 miles would be located away from the boundary of the existing pipeline corridor. Approximately 18.8 miles of the 20.2 miles would be located on BLM administered federal lands.

Approximately 1.8 miles (0.8 mile of federal lands) of the proposed 300-foot wide, 62.1-mile long BFGC between Bird Canyon Compressor Station and the Blacks Fork Gas Plant would be located away from the boundary of the existing pipeline corridor. The location of the proposed 300-foot wide, 45.5-mile long OPC between the Bird Canyon Compressor Station and the Opal Gas Processing Plant would be adjacent to an existing corridor for its entire length.

Gas Sales Pipelines. RGS proposes to construct a 103.6-mile long, 30-inch diameter, natural gas pipeline (Rendezvous Phase 6 or R6 Pipeline) within the proposed BCC and BFGC to transport natural gas produced in the PAPA to gas processing plants. Segment 1 of the



proposed R6 Pipeline (41.5 miles) would be located in the BCC, beginning at the Pinedale/Gobblers Knob Compressor Station and ending at the Bird Canyon Compressor Station (see description of the BCC above). Segment 2 of the proposed R6 Pipeline (62.1 miles) would begin at the Bird Canyon Compressor Station and end at the Blacks Fork Processing Plant (see description of the BFGC above). It is anticipated that the R6 Pipeline would be constructed during the summer and fall of either 2007 or 2008.

JGGC proposes to construct a 41.5-mile long, 36-inch natural gas pipeline (Paradise to Bird Canyon or PBC Pipeline) and a connecting 45.5-mile long, 30-inch pipeline (Opal Loop III Pipeline) to transport natural gas from the PAPA to gas processing plants (see Map 2.4-1). The PBC Pipeline would be located in the BCC and would parallel Segment 1 of the R6 Pipeline. The Opal Loop III Pipeline would be located in the OPC and would parallel the Bridger Pipeline that was constructed in 2006. It is anticipated that the PBC and Opal Loop III pipelines would be constructed after 2008.

The proposed R6 Pipeline (segments 1 and 2) and the PBC and Opal Loop III pipeline projects would include construction of ancillary facilities (valves, pigging equipment, side taps, and metering equipment). Table 2.4-3 shows the initial disturbance and the LOP disturbance for the pipelines. Each pipeline project would require a permanent right-of-way of 50 feet for operation and maintenance. The entire permanent right-of-way and the construction right-of-way would be revegetated. It is assumed that approximately 1.0 acre would be required for each pipeline for permanent ancillary aboveground facilities. Development Procedures for the proposed pipelines are included in Appendix D.

Table 2.4-3
Estimated Initial and Life-of-Project Disturbance
for Gas Sales Pipelines and Granger Gas Processing Plant

Component	Number or Miles	Total Disturbance (acres)	Life-of- Project Disturbance (acres)
30-inch Rendezvous (R6) Pipeline ¹	103.6 miles	1,506.9	1.0
R6 temporary extra work areas ²	168 miles	23.3	0.0
R6 temporary extra work areas – HDDs ³	4 sites	8.3	0.0
Subtotal		1,538.5	1.0
36-inch Paradise to Bird Canyon (PBC) Pipeline ¹	41.5 miles	603.6	1.0
PBC temporary extra work areas ²		9.4	0.0
PBC temporary extra work areas – HDDs ³	2 sites	4.2	0.0
Subtotal		617.2	1.0
30-inch Opal Loop III Pipeline ¹	45.5 miles	661.8	10
Opal Loop III temporary extra work areas ²		10.5	0.0
Subtotal		672.3	1.0
Granger Gas Processing Plant	1 site	86.4	86.4
Total Sales Pipelines/Gas Plant	1 site	2,914.4	89.40
¹ Disturbance based on 120 foot construction right of way width.			
² Temporary extra work areas are required for road, foreign line, historic trail and waterbody crossings.			
³ horizontal direction drill.			

Gas Processing Plant Expansion. In conjunction with the proposed R6 Pipeline Project, RGS proposes to expand the existing 33.6-acre Granger Gas Processing Plant by 86.4 acres, for a total of 120 acres on BLM administered federal lands in Section 16, T. 18 N., R. 111 W. The purpose of the proposed expansion is to construct and operate additional natural gas processing facilities to sufficiently increase processing capacity for an anticipated increased

input of 600 million standard cubic feet per day (MMSCF/D) of natural gas and crude petroleum. The current Granger Gas Processing Plant capacity is 600 MMSCF/D. The expansion would represent a 100 percent increase in treatment capacity. RGS and Mountain Gas Resources (MGR) anticipate constructing and operating new facilities, including compressors, gas processing equipment, liquids handling equipment, and supporting facilities, such as office space, parking, and fencing.

Although specific facility requirements, engineering, and designs are currently under development, maximum emissions have been estimated, and these values have been included in the air quality impact analysis for this Draft SEIS. RGS and MGR have assumed a maximum emissions scenario based on emissions from the current Granger Gas Processing Plant with a 600 MMSCF/D treatment configuration. The installation and operation of new, improved gas processing facilities should result in reduced emissions over the estimated amount.

Trunk Pipelines. QGM is proposing to install a 7.5-mile long, 30-inch gas pipeline from the Stewart Point Area to the 4-way area along existing rights-of way. They are also proposing to install two 7.8-mile long, 30-inch gas pipelines from the 4-way area to the Pinedale/Gobblers Knob Compressor Station. Initial disturbance requires 232.7 acres adjacent to, or within, existing rights-of-way for most of the route. QGM is also proposing to install a 22.8-mile long, 10-inch water line from the Stewart Point area to Highway 351. This requires an initial disturbance of 161.7 acres adjacent to, or within, existing rights-of-way for most of the route.

JGCC is proposing to install two 7.8-mile long 12-inch gas pipelines from the 4-way area to the Paradise Compressor Station, with an initial disturbance of 71.0 acres. This disturbance would occur adjacent to or within existing rights-of-way for most of the route.

Ancillary Facilities. Expansion of existing ancillary facilities, including compressor stations, central gathering facilities (CGFs), stabilizer sites, and water truck unloading facilities, are components that are common to all alternatives and are described below.

Compressor Stations. QGM and JGCC propose expansion of three compressor stations within the PAPA and one compressor station outside of the PAPA (Bird Canyon Compressor Station) through 2011 (see Table 2.4-4). The expansions include an additional 267,038 hp of compression, with additional LOP disturbance of 90 acres within the PAPA.

Table 2.4-4
Compressor Station Expansion Common to all Alternatives

Compressor Station Name	Field	Owner	Location	Additional Compression (hp)	Additional Disturbance (acres)
Pinedale/Gobblers Knob	PAPA	QGM	Section 2, T. 31 N., R. 109 W.	31,000 (2009)	20
Paradise	PAPA	JGCC	Section 2, T. 31 N., R. 109 W.	59,000 (2011) 125,000 (2011)	40
Falcon	PAPA	JGCC	Section 36, T. 30 N., R. 108 W.	7,366 (2011) 30,000 (2011)	30
Bird Canyon	SE of Jonah	JGCC	Section 34 T. 27 N., R. 111 W.	14,672 (2011)	0
Total				267,038	90

Central Gathering Facilities QGM is proposing six additional central gathering facilities (formerly known as central delivery points) to support their existing liquids gathering system

within the PAPA. Each CGF would require an additional 2 acres of disturbance for a LOP disturbance of 12 acres.

Stabilizer Facilities. QGM is proposing to expand the stabilizer site near the Pinedale/Gobblers Knob Compressor Station in support of their existing liquids gathering system. This expansion would require an additional LOP disturbance of 5 acres.

Water Truck Unloading Facilities. QGM is proposing to install truck unloading facilities near Highway 351 within the PAPA in support of their existing liquids gathering system. QGM's water trucking facility would require a LOP disturbance of 7 acres. QGM is proposing an additional truck unloading facility at the Falcon Compressor Station that would require an additional LOP disturbance of 15 acres.

Development of Deeper Formations. There is insufficient information to understand the level of development that may occur for recovery of natural gas from deeper formations. Future deep development would be allowed within the constraints of each alternative, or would undergo separate environmental analysis.

2.4.2.2 Alternative A (No Action Alternative)

In many instances, the No Action Alternative means “no project” when a new project is proposed. The No Action Alternative can also mean “no change”, in this case, from BLM's current management in the PAPA. In this Draft SEIS, the No Action Alternative has elements of both meanings; the Operators' Proposed Action would not occur and BLM would continue to manage natural gas development in the PAPA, based on all provisions of the PAPA ROD (BLM, 2000b) and subsequent Decision Records (BLM, 2004a, 2005a, 2005b, and 2005c). Both meanings are consistent with the DOI's (2004) NEPA Revised Implementing Procedures (in 516 DM §4.10(6)). Mitigation under the No Action Alternative would be the measures set forth in the PAPA ROD.

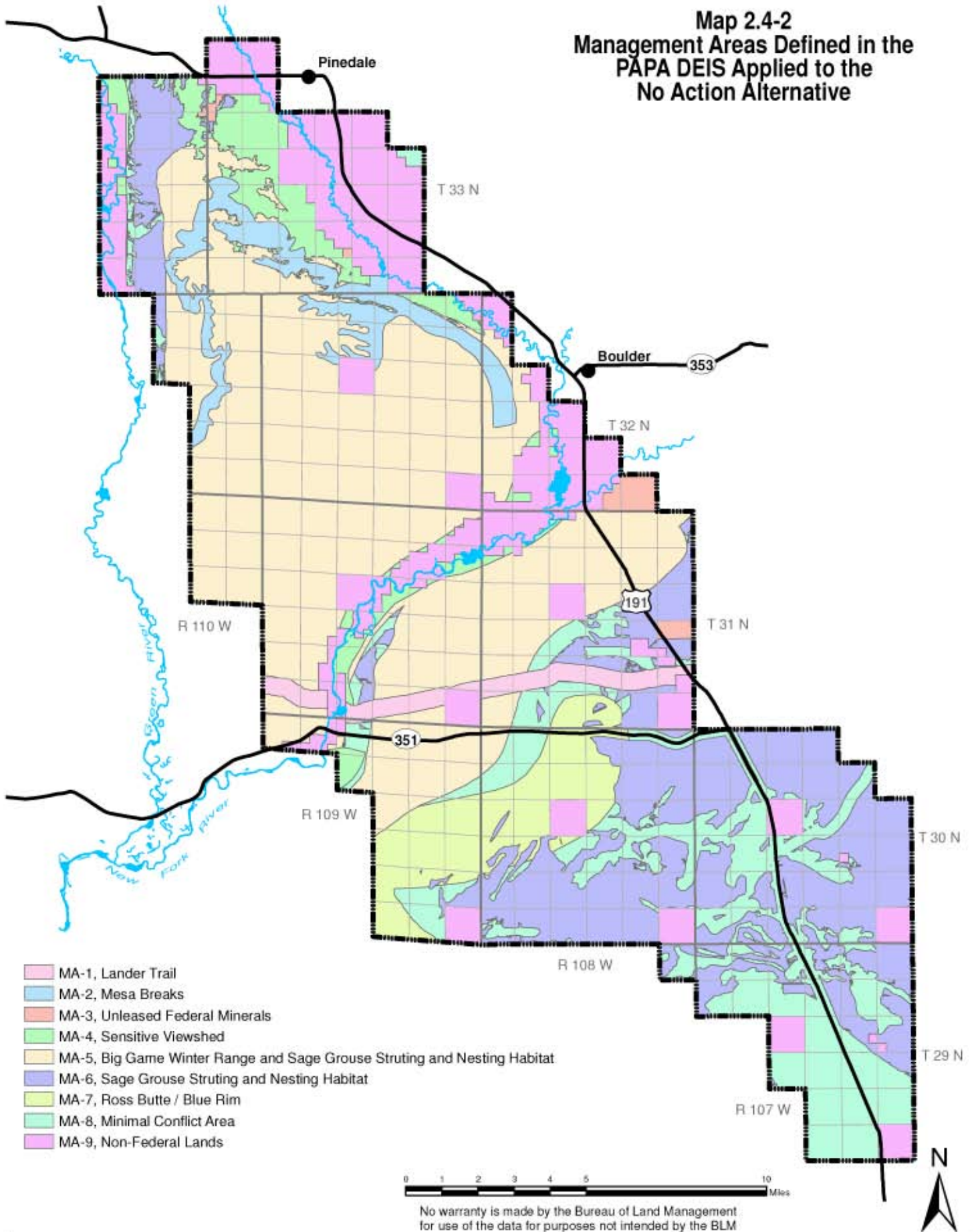
Continued Management Practices. The No Action Alternative is based on elements authorized by the PAPA ROD (BLM, 2000b) including:

- Approved Project Components (PAPA ROD Section 2),
- Administrative Requirements and Conditions of Approval (PAPA ROD Section 3), and
- Management Area Exploration and Development Restrictions and Limitations for Resource Protection (PAPA ROD Section 4).

Development in the PAPA beyond the limits and analysis thresholds specified in the PAPA ROD would require additional environmental review. Those thresholds are still in place in the No Action Alternative. The PAPA ROD did not specify the type or extent of the additional environmental review that would be required.

The PAPA ROD (BLM, 2000b) established thresholds on the number of producing well pads specified for each of nine MAs (see Map 2.4-2). There are timing and geographic restrictions on surface development in some MAs that would be carried through the No Action Alternative. For example, in MA 5 - *Big Game Winter Range and Sage Grouse Strutting and Nesting Habitat*, the PAPA ROD stipulated that drilling was not allowed on federal lands and minerals between November 15 and April 30, although BLM may grant exceptions to the restriction in consultation with WGFD (Section 1.3). Similarly, in MA 5 and MA 6 - *Sage Grouse Strutting and Nesting Habitat*, additional seasonal restrictions were stipulated to protect greater sage-grouse seasonally-used habitats, applicable on a site-specific basis, but which could limit drilling activities between March 1 and July 31.

Map 2.4-2
Management Areas Defined in the
PAPA DEIS Applied to the
No Action Alternative



The operators provided information on how they would further develop the PAPA under the No Action Alternative (current management practices) while adhering to seasonal stipulations for wildlife. Using their projections, limitations to wellfield development as set forth in the PAPA ROD (BLM, 2000b), would be reached as follows:

- 212 well pad limit in MA 5 would be reached in 2009;
- Approximately 276.0 miles of road would be reached in 2011.
- 68 well pad limit in MA 7 would be reached in 2011;
- 28 well pad limit in MA 4 would be reached in 2013; and
- 700 well pad limit in the entire PAPA would be reached in 2014.

The air quality impact analysis conducted for the PAPA DEIS (BLM, 1999a) included 700 producing well locations, 900 wells drilled, and up to eight drilling rigs operating in the PAPA. It further assumed approximately 1,000 horsepower per drilling rig. The PAPA ROD states

“If activity and corresponding emission assumptions and/or impacts exceed those identified in the Pinedale Anticline EIS (376.59 tons/year of NO_x emission from compressors or 693.5 tons/year NO_x emissions from the combination of construction/drilling, well production, and compression), the BLM, in cooperation and consultation with Wyoming Department of Environmental Quality-Air Quality Division (DEQ-AQD), EPA Region VIII, USDA-Forest Service, and other affected agencies, will undertake additional cumulative air quality environmental review as required by CEQ regulations 40 CFR 1502.9(c)(1)(ii).”

Since the PAPA ROD (BLM, 2000b) was issued, natural gas development within the PAPA has occurred at a pace greater than was analyzed in the PAPA EIS. Assumptions of drill rig emissions and NO_x emissions from the combination of construction/drilling, well production, and compression have been exceeded. The air quality impact analysis conducted for this Draft SEIS will serve as the additional environmental review referenced above, as well as to analyze the current proposal.

In the No Action Alternative, air quality impacts were modeled for the year 2007 to show the increase in impacts beyond that predicted in the PAPA DEIS (BLM, 1999a). It is estimated that there will be up to 900 producing wells in 2007. The 2007 air quality impact analysis discloses impacts for current allowable development in the PAPA under the No Action Alternative (before reaching surface disturbance limits). The 2007 air quality impact analysis assumed approximately 900 producing wells, 43 drilling rigs operating in the summer, and 30 drilling rigs operating in the winter, with approximately 3,875 hp for each drilling rig.

Even though the limit of 212 producing well pads in MA 5 authorized in the PAPA ROD would be attained in 2009, the No Action Alternative is analyzed through 2011 to allow comparison between all alternatives (No Action Alternative, Proposed Action Alternative, and Alternative C) in 2011 for most resources. The No Action Alternative, through 2011, includes approximately 1,800 producing wells.

Project Components. The project components in the No Action Alternative include well pads, roads, and gathering (gas and liquid) pipelines. Transportation corridors, gas sales pipelines, the Granger Gas Processing Plant expansion, trunk pipelines and ancillary facilities are also included in the No Action Alternative. These components are required for continued transport of natural gas and liquids from the PAPA as development carries forward under the PAPA ROD (BLM, 2000b), and are detailed in Section 2.4.2.1 – Components Common to All Alternatives. Projected disturbance was determined from responses provided by the Operators regarding how they would continue to develop natural gas resources under the PAPA ROD and subsequent Decision Records (BLM, 2004a, 2005a, 2005b, and 2005c).

The proposed project components and estimated disturbance for the No Action Alternative through 2011 are provided in Table 2.4-5. Initial disturbance is defined as the amount of acreage that is disturbed at the time of construction. Initial disturbance for the No Action Alternative for well pads, roads, and gathering pipelines is estimated to be 3,890.3 acres. LOP disturbance for the same components is expected to be 1,179.5 acres. LOP disturbance is defined as the amount of disturbance remaining once reclamation has occurred. For example, it is assumed that well pad reclamation would achieve 40 percent of the initial disturbance when all development activities have been completed. Likewise, it is assumed that 20 percent of the initial disturbance for roads would be reclaimed while 80 percent of the disturbance would remain to support continued operations.

Table 2.4-5
Estimated Initial and Life-of-Project
Disturbance under the No Action Alternative through 2011

Component	Number or Miles	Initial Disturbance (acres)	Life-of- Project Disturbance (acres)
Well Pads, Roads and Gathering Pipelines			
Well Pads ¹	245 pads	2,559.0	1,023.6
Local and Resource Roads ²	108.0 miles	654.8	194.9
Gas Gathering Pipelines ³	105.6 miles	640.4	0.0
Liquid gathering pipelines – QGM ⁴	6.0 miles	36.1	0.0
Subtotal		3,890.3	1,179.5
Trunk Pipelines and Ancillary Facilities			
30-inch Mesa Loop Lines ⁵	15.3 miles	232.5	2.00
10-inch water line ⁶	22.8 miles	161.7	2.00
12-inch gas pipelines ⁷	7.8 miles	71.0	2.00
Compressor Sites (expansion)	3 sites	90.0	90.00
Central Gathering Facilities	6 sites	12.0	12.00
Water Trucking Facility	1 site	7.0	7.00
Falcon Truck Unloading	1 site	15.0	15.00
Expand Stabilizer Site	1 site	5.0	5.00
Subtotal		594.2	135.00
Total Wellfield Components		4,484.5	1,314.5
¹ Disturbance includes new well pads and expansion of existing well pads. LOP disturbance assumes 60 percent reclamation of well pads. ² Assumes no new collector roads would be built within the PAPA, estimate for miles of proposed roads based on factors determined from existing roads. LOP disturbance assume 20 percent reclamation of roads. ³ Estimate for miles of proposed gas gathering pipelines based on factors determined from existing roads. ⁴ Estimate for miles of proposed liquid gathering pipelines are based on data provided by the Operators. ⁵ Disturbance based on 200-foot construction right-of-way width. Includes one 30-inch gas pipeline from Stewart Point area to 4-way area (7.5 miles) and two 30-inch gas pipelines from 4-way area to Pinedale/Gobblers Knob Compressor Station (7.8 miles). ⁶ Disturbance based on 50-foot construction right-of-way width from Stewart Point area to Highway 351. ⁷ Disturbance based 50-foot construction right-of-way width. Includes two 12-inch gas pipelines from 4-way area to Paradise Compressor Station.			

Nearly all initial disturbance for pipelines would be reclaimed, leaving almost no LOP disturbance. In contrast, for other ancillary facilities such as compressor station expansion, central gathering facilities, etc., the LOP disturbance would be the same as the initial disturbance, i.e., none of the disturbance would be reclaimed until the facility is no longer in use.

Wells and Drilling Rigs. The estimated number of drilling rigs operating and wells drilled per year under the No Action Alternative is provided in Table 2.4-6. More rigs would be operating in the summer than in the winter under the No Action Alternative because seasonal wildlife restrictions would apply in big game crucial ranges.

Table 2.4-6
Proposed Wells and Drilling Rigs by Year under the No Action Alternative

Year	Wells	Drilling Rigs	
		Summer	Winter
2007	231	43	30
2008	235	43	30
2009	236	43	30
2010	217	40	27
2011	220	40	27
Total	1,139		

Well Pads. The Operators have proposed additional well pads within each MA. The additional pads have been added to the current number of well pads in the PAPA (Table 2.4-7). From the progression in Table 2.4-7, it is evident that the threshold of 212 pads in MA 5 would be reached in 2009. Likewise, the threshold of 68 pads in MA 7 would be reached in 2011, assuming all well pads support producing wells.

Table 2.4-7
Total Number of Well Pads Within each Management Area that have been Proposed by the Operators under the No Action Alternative

Year	Total Well Pads in Year – No Action Alternative											
	MA 4 Limit 28		MA 5 Limit 212		MA 6 Limit 183		MA 7 Limit 68		MA 8 Limit 168		MA 9 Limit 200	
	No.	Total	No.	Total	No.	Total	No.	Total	No.	Total	No.	Total
2005	5	5	113	113	43	43	25	25	31	31	49	49
2006	0	5	16	129	2	45	5	30	1	32	2	51
2007	4	9	43	172	8	53	16	46	12	44	4	55
2008	4	13	21	193	9	62	6	52	9	53	4	59
2009	4	17	19	212	9	71	6	58	7	60	6	65
2010	4	21	0	212	8	79	6	64	7	67	2	67
2011	3	24	0	212	8	87	4	68	7	74	0	67

Under the No Action Alternative, when the threshold number of producing wells has been reached in a specific MA, additional development would be halted until additional environmental analyses are complete or until a well on a pad is no longer producing gas, is plugged, and the pad area is reclaimed for one full growing season. The reclaimed pad would be credited back to the MA and a new well pad could be developed, as long as the approved threshold is not exceeded.

Initial disturbance estimates for 245 new well pads by 2011 is 2,559.0 acres, with a LOP estimated disturbance of 1,023.6 acres. Reclamation of well pads would be similar to current reclamation practices.

Roads and Gathering Pipelines. Under the No Action Alternative, it is assumed that there would be no additional construction of collector roads within the PAPA. There would be approximately 108.0 miles of local and resource roads constructed in the PAPA by 2011, for an initial disturbance of 654.8 acres and a LOP disturbance of 194.9 acres, assuming that 20 percent of the initial road disturbance is reclaimed after construction (see Table 2.4-5). There would also be approximately 105.6 miles of gas gathering pipelines and 6.0 miles of liquid gathering pipelines, for an initial disturbance of 640.4 and 36.1 acres, respectively. There is no

LOP disturbance associated with construction of gathering pipelines because the entire disturbance is reclaimed after construction.

2.4.2.3 Alternative B (The Proposed Action)

The Operators have voluntarily proposed a long-term development plan for the PAPA referred to as “Concentrated Development” to recover the estimated 20 to 25 TCF of natural gas in the PAPA. The Operators have defined a “core area” within the PAPA, mostly along the Anticline Crest, where the majority of development activity would take place (see Map 2.4-3). The core area encompasses 43,623.5 acres (68.1 square miles), or 22 percent of the PAPA. Within the core area, the Operators have defined three Concentrated Development Areas (CDAs) that would move slowly as pads are drilled out. Each of the three individual CDAs would not exceed 8 square miles; however, they would be tightly grouped, with the combined area of the three not exceeding 19 square miles. The Operators have proposed the CDAs and their movement to leave large, contiguous blocks of land and corridors available for wildlife without active natural gas development activities. The Operators have provided examples of CDAs and how they could move from 2007 through 2011. Map 2.4-3 shows a composite of the three CDAs for 2007 through 2011. In other words, the three CDAs would most likely be in these three areas over the first 5 years, while adhering to the size restrictions stated above. Operators would attempt to fully develop each multi-well pad to the approved bottom-hole spacing before moving drilling rigs off of pads. It is estimated that rigs would move to a new pad an average of once per year. Pad reclamation would proceed as soon as practical when the last well on the pad is completed, reducing net disturbance as development proceeds. Interim reclamation would occur for pads not scheduled for development activity within 2 years.

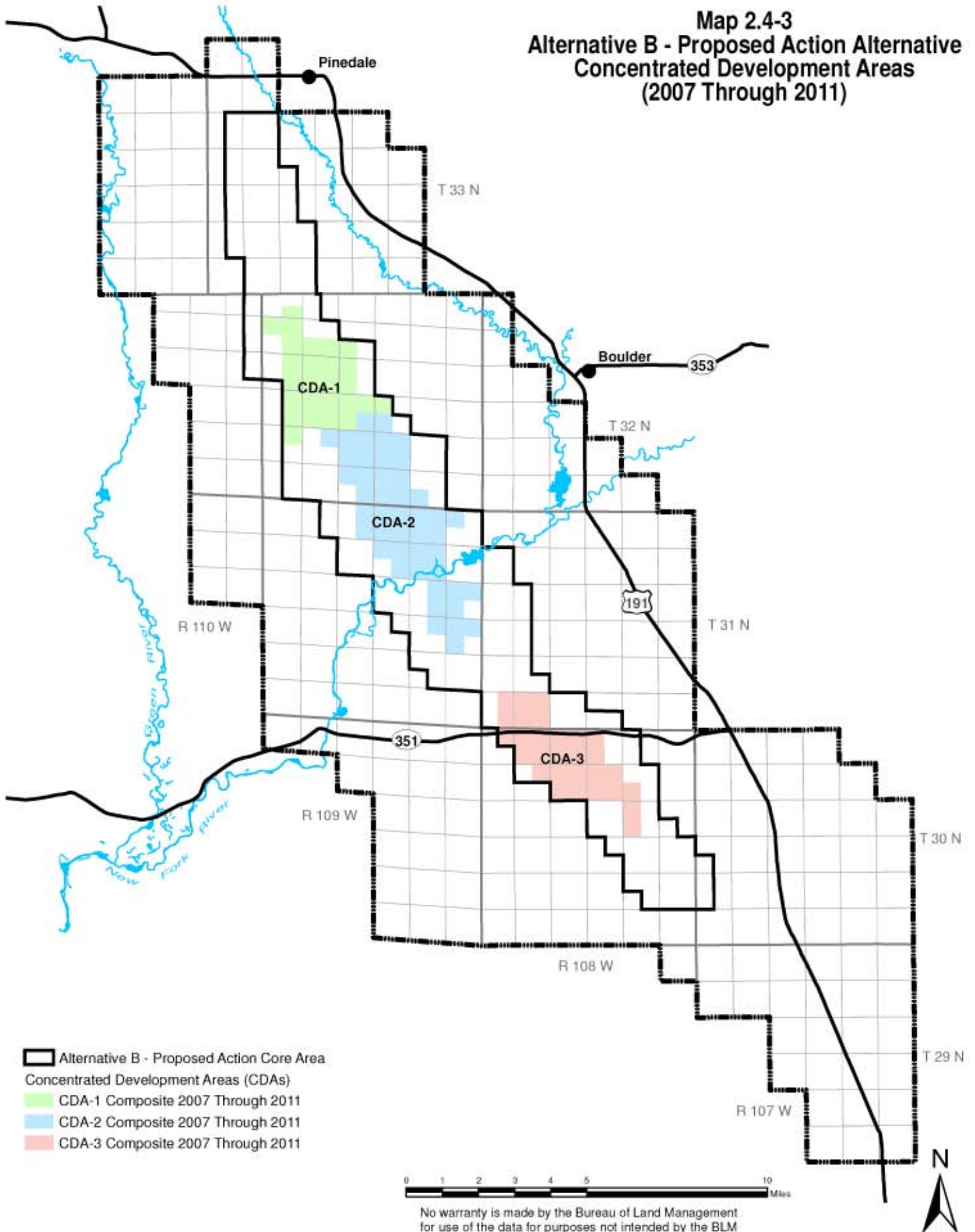
The Operators are proposing production initiatives that would lower human presence year-round and throughout the production phase. One of these initiatives is the installation of a liquids gathering system in the central and southern portions of the PAPA, which would nearly eliminate trucking of produced water and condensate (see Appendix C for further description of the liquids gathering system). It would also allow for removal of some storage tanks on well pads that currently store condensate and produced water. The Operators propose to expand the use of computer assisted operations on multi-well pads to reduce the number of daily visits by production operations personnel.

To provide more predictability during the development phase, the Operators are proposing to develop a 10-year rolling forecast or development plan working with BLM and WGFD. Each year, the Operators would review these plans with BLM and WGFD to seek improvements to the development plan in an attempt to further reduce impacts.

The Operators are proposing to conduct year-round drilling, completions, production, and construct ancillary facilities while utilizing multi-well pad development and directional drilling within the three CDAs. This would require temporary relaxation of stipulations where the CDA is active within big game crucial winter range and other sensitive wildlife habitats during the seasonally restricted periods. The Operators have provided plans which are included in Appendix C including a Transportation Plan, Reclamation Plan, Hazardous Materials Summary, and a Wildlife and Habitat Mitigation Plan.

The northern-most portion of the PAPA contains mostly a single operator's contiguous leases, unlike the central and southern portion, where many of the leases are in a checkerboard ownership pattern. CDA-1 (see Map 2.4-3) would be located in the north within the core area of mostly single operator contiguous leases. Under the Proposed Action, CDA-1 would begin at the southern end of the mostly single operator leasehold and slowly move north.

Map 2.4-3
Alternative B - Proposed Action Alternative
Concentrated Development Areas
(2007 Through 2011)



The middle and southern portion of the PAPA contain leases that are operated primarily in a checkerboard ownership pattern within the core area. Under the Proposed Action, the Operators propose to work together to develop their leases within CDA-2 and CDA-3. CDA-2 would initially be located at the southern boundary of CDA-1, essentially further concentrating the development. As leases are drilled out, CDA-2 would slowly move to the south. The Operators would work together to develop CDA-3 in the southern portion of the PAPA (see Map 2.4-3). CDA-3 would move to the south at approximately the same pace as CDA-2.

The Operators are proposing to drill delineation wells within the first 5 years to assess production capabilities and ultimate well density required to develop their leases, both within and outside of the core area. A portion of the delineation wells would be drilled on well pads with existing producing wells. Where possible, the delineation wells would be drilled in accordance with all seasonal stipulations. There may be some instances in the first 5 years where delineation wells must be drilled outside of the CDAs and outside of the core area during the seasonally restricted periods. This would require an exception from BLM for temporary relaxation of seasonal stipulations. Once the 5-year delineation period is over, all drilling in all seasons would be restricted to the three CDAs. Operators are committing to interim reclamation on pads not scheduled for development under the CDA plan within 2 years. The pads would be reclaimed to the size required for safe production operations.

All development drilling would be on consolidated pads from which multiple wells would be drilled. Some delineation wells are planned to be drilled on new pads with one to three wells on the pad while other delineation wells would be drilled from existing producing pads. Small delineation pads would be expanded to accommodate additional wells (when they become part of a CDA), if commercially successful, or would be reclaimed if the wells are not commercially successful. Expansion of existing producing pads, by up to 21 acres, would be necessary to accommodate additional drilling.

Additional production from leases that have existing liquids gathering systems would be joined to the existing system. Operators are proposing to install additional liquids gathering systems (within 2 years of issuance of the ROD) to transport condensate and produced water from their leases to central gathering facilities. Production from delineation wells would be joined to the liquids gathering system, where possible, and placed within existing rights-of-way.

Construction of ancillary facilities (compressor station expansions, central gathering facilities, and gathering and sales pipelines) would take place both within and outside the CDAs. Topsoil removal for pad and/or road construction, would not be conducted during frozen soil conditions. Development procedures for wellfield activities are provided in Appendix C.

As part of the Proposed Action Alternative, the Operators plan to implement Tier 2 equivalent emissions technology on all of their new drilling rig engines within 2 years after issuance of the ROD. Some drilling rig engines would continue to have higher emissions (i.e., Tier 0 and Tier 1); however, these drilling rigs would be phased out after 2010. Of the 48 drilling rigs proposed by the end of 2009, 29 would have Tier 2 equivalent emission levels, 15 drilling rigs would have Tier 1 equivalent emission levels, and 4 drilling rigs would have Tier 0 equivalent emission levels.

Project Components. Estimated disturbance for each component under the Proposed Action Alternative is provided in Tables 2.4-8 and 2.4-9 through 2011 and 2023, respectively. Although the Proposed Action includes long-term development through 2023, disturbance is also shown for 2011 to provide a comparison to the No Action Alternative, which is only carried forward through 2011. Estimates are provided for initial disturbance and LOP disturbance for each project component.

In their long-term development plan, the Operators provided estimates for the number of new and expanded pads by year, and the estimated disturbance associated with well pads through 2023. Estimates for disturbance associated with roads and gas gathering pipelines were determined using factors for existing gas gathering pipelines and roads per well pad. Disturbance estimates for expansion of the existing liquids gathering system, construction of the proposed liquids gathering system, and for construction of trunk pipelines and ancillary facilities, were provided by the Operators. With those estimates, the initial disturbance under the Proposed Action Alternative is 6,845.0 acres through 2011, and 12,278.4 acres through 2023 (see Tables 2.4-8 and 2.4-9).

**Table 2.4-8
Estimated Initial and Life-of-Project Disturbance
under the Proposed Action Alternative through 2011**

Component	Number or Miles	Initial Disturbance (acres)	Life-of-Project Disturbance (acres)
Well Pads, Roads and Gas Gathering Pipelines			
Well Pads ¹	179 pads	3,427.0	1,370.8
Local and Resource Roads ²	88.7 miles	537.5	430.0
Gas Gathering Pipelines ³	93.1 miles	524.2	0.00
Liquid Gathering Pipelines ⁴	235.8 miles	1,428.9	
Subtotal		5,917.6	1,800.8
Trunk Pipelines and Ancillary Facilities			
30-inch Mesa Loop Lines ⁵	15.3 miles	232.7	2.0
10-inch water line ⁶	22.8 miles	161.7	2.0
12-inch gas pipelines ⁷	7.8 miles	71.0	2.0
Trunk lines – liquid gathering ⁸	18 miles	164.0	0.0
Water Redistribution ⁴	6 miles	36.0	0.0
Pipeline Interconnection	0.5 mile	3.0	0.0
Compressor Sites (expansion)	3 sites	90.0	90.0
Central Gathering Facilities	9 sites	90.0	90.0
Central Gathering Facilities	6 sites	12.0	12.0
Falcon Stabilizer Facility	1 site	20.0	20.0
Water Trucking Facility	1 site	20.0	20.0
Water Trucking Facility	1 site	7.0	7.0
Falcon Truck Unloading	1 site	15.0	15.0
Expand Stabilizer Site	1 site	5.0	5.0
Subtotal		927.4	265.0
Total Wellfield Components		6,845.0	2,065.8
¹ Disturbance includes new well pads and expansion of existing well pads. LOP disturbance assumes 60 percent reclamation of well pads. ² Assumes no new collector roads would be built within the PAPA, estimate for miles of proposed roads based on factors determined from existing roads. LOP disturbance assume 20 percent reclamation of roads. ³ Estimate for miles of proposed gas gathering pipelines based on factors determined from existing roads. ⁴ Estimate for miles of proposed liquid gathering pipelines are based on data provided by the Operators. ⁵ Disturbance based on 200-foot construction right-of-way width. Includes one 30-inch gas pipeline from Stewart Point area to 4-way area (7.5 miles) and two 30-inch gas pipelines from 4-way area to Pinedale Compressor Station (7.8 miles). ⁶ Disturbance based on 50-foot construction right-of-way width from Stewart Point area to Highway 351. ⁷ Disturbance based 50-foot construction right-of-way width. Includes one 12-inch crude petroleum pipeline and one water pipeline from 4-way area to Paradise Compressor Station. ⁸ Disturbance based on 75-foot construction right-of-way width.			

Table 2.4-9
Estimated Initial and Life-of-Project
Disturbance under the Proposed Action Alternative through 2023

Component	Number or miles	Total Disturbance (acres)	Life-of-Project Disturbance (acres)
Well Pads, Roads and Gas Gathering Pipelines			
Well Pads ¹	250 pads	8,112.0	3,244.8
Local and Resource Roads ²	120.8 miles	729.4	583.5
Gas Gathering Pipelines ³	118.6 miles	721.6	0.0
Liquids Gathering Pipelines	295.0 miles	1,788.0	
Subtotal		11,351.0	3,828.3
Trunk Pipelines and Ancillary Facilities ⁵		927.4	265.0
Total Wellfield Components		12,278.4	4,093.3
¹ Disturbance includes new well pads and expansion of existing well pads. LOP disturbance assumes 60 percent reclamation of well pads. ² Assumes no new collector roads would be built within the PAPA, estimate for miles of proposed roads based on factors determined from existing roads. LOP disturbance assume 20 percent reclamation of roads. ³ Estimate for miles of proposed gas gathering pipelines based on factors determined from existing roads. ⁴ Estimate for miles of proposed liquid gathering pipelines are based on data provided by the Operators. ⁵ Detail for trunk pipelines and ancillary facilities is described in Table 2.4-8 for the Proposed Action Alternative 2011.			

Wells and Drilling Rigs. The Operators estimate that all surface disturbance (roads, gathering pipelines and well pad construction) would be complete by 2023, with drilling continuing through 2025. Table 2.4-10 shows the estimated number of wells drilled per year and the estimated number of drilling rigs that would be operating in the PAPA each year. At the end of 2011, there would be approximately 1,453 additional wells drilled in the PAPA under the Proposed Action Alternative. At the end of 2023, there would be approximately 4,399 wells drilled. Table 2.4-10 shows that there is an initial increase in estimated drilling rigs (from the current level of 33 rigs) in the PAPA, peaking in 2009 with 48 rigs. The estimated rig number stabilizes at 45 before it begins to decline as Operators have drilled out their leases. The Operators are proposing that the most wells drilled in any one year would be about 305. The number of wells drilled per year also begins to decline as leases are drilled out. The number of proposed wells is an estimate based on estimated proposed rigs and current drilling.

Well Pads. The Operators are proposing development that utilizes consolidated well pads on a wide-scale throughout the PAPA. Therefore, the sequence described in the PAPA DEIS (BLM, 1999a) is no longer applicable. The majority of the new wells would be drilled from existing pads that may require expansion by up to 21 acres but no new access roads, gathering pipelines and water wells would be required for the existing pads. Some wells would be drilled from new pads that may become expansion pads. These new pads would require a new access road, gathering pipelines and a water well supply well if the wells are successful.

Operators are proposing to drill up to 4,399 additional wells in the PAPA between 2007 and 2025. It is estimated that to drill these wells, 250 new well pads would be required (179 new pads by 2011). In all, the total number of well pads in the PAPA in 2024 is expected to be 598, the sum of 322 existing pads in 2005, 26 pads in 2006, and 250 pads in the Proposed Action.

Table 2.4-10
Estimated Wells and Drilling Rigs by Year
for the Proposed Action Alternative Through 2025

Year	Wells	Drilling Rigs
2007	268	35
2008	299	45
2009	305	48
2010	291	45
2011	290	45
2012	289	45
2013	288	45
2014	287	45
2015	287	45
2016	286	45
2017	282	44
2018	279	43
2019	213	35
2020	187	28
2021	177	26
2022	143	21
2023	112	19
2024	107	16
2025	9	3
Total	4,399	

Initial disturbance estimates for 179 well pads through 2011 is 3,427.0 acres, with a LOP disturbance estimate of 1,370.8 acres (Table 2.4-8). By 2023, the initial disturbance estimate for 250 well pads is 8,112.0 acres, with a LOP disturbance estimate of 3,244.8 acres (Table 2.4-9). The Operators have prepared a Reclamation Plan (Appendix C). Under the Plan, initial disturbance associated with well pads would be reclaimed to a LOP disturbance of 40 percent (i.e., only 40 percent of the initial disturbance on a pad would remain, once development is complete).

Roads and Gathering Pipelines. Under the Proposed Action Alternative, it is assumed that there would be no additional construction of collector roads within the PAPA. There would be approximately 88.7 miles of local and resource roads constructed in the PAPA by 2011, for an initial disturbance of 537.5 acres, and a LOP disturbance of 430.0 acres, assuming that 20 percent of the initial road disturbance would be reclaimed within one growing season after construction (see Table 2.4-8). There would also be approximately 118.6 miles of gas gathering pipelines and 295.0 miles of liquid gathering pipelines by 2023, for an initial disturbance of 721.6 acres and 1,788.0 acres, respectively (see Table 2.4-9). There is no LOP disturbance associated with construction of gathering pipelines because the entire disturbance is reclaimed after construction.

Currently, condensate and produced water are trucked from the central and southern portions of the PAPA. The Operators are proposing to install an additional 235.8 miles of liquids gathering pipelines by 2011, which would be 295.0 miles by 2023. The gathering system would disturb 1,428.9 acres and 1,788.0 acres in 2011 and 2023, respectively. The liquids gathering pipelines would be connected to the pipeline that delivers crude petroleum to the processing facilities. Produced water would be collected at truck unloading facilities and transported to various commercial water disposal locations.

Trunk Pipelines. In addition to the trunk pipelines described in Section 2.4.2.1 (Components Common to All Alternatives), the Operators are proposing to install an 18-mile long liquids trunk line, 6 miles of water redistribution pipelines, and a 0.5-mile pipeline interconnection in support

of the new liquids gathering systems. Total estimated initial disturbance for these pipelines is 203.0 acres.

Ancillary Facilities. Several ancillary facilities, including expansion of existing facilities, are proposed within the PAPA.

Compressor Stations. In addition to the compression included in Section 2.4.2.1 (Components Common to All Alternatives), QGM is proposing to install an additional 15,500 hp of compression at the Pinedale/Gobblers Knob Compressor Station in 2015. Combined, the Proposed Action includes 282,538 hp of new compression, all to be located at existing compressor stations.

Central Gathering Facilities As part of the new gathering system, the Operators are proposing to construct nine CGFs requiring 10 acres each, for a total initial and LOP disturbance of 90 acres.

Stabilizer Facilities. The Operators are proposing to build a stabilizer facility at the Falcon Compressor Station that would require an additional 20 acres of LOP disturbance. The purpose of the stabilizer is to make a “stable” product (crude petroleum) that can be metered, and it then would be sent to the pipeline for transport off the PAPA.

Water Truck Unloading Facilities. In addition to facilities described in Section 2.4.2.1 (Components Common to All Alternatives) and in support of the new gathering system, the Operators are proposing to install truck unloading facilities near Highway 351. This would require an initial and LOP disturbance of 20 acres.

Options to eventually pipe, rather than truck, the produced water collected at the truck unloading facilities are in the early preliminary investigation phases. One option would be to build pipeline spurs running from the truck unloading facility to the nearby evaporation pit facilities operated by Anticline Disposal. Another option would be to construct a water disposal pipeline running from the truck unloading facility to the Big Piney Water Disposal Facility located approximately 35 miles southwest of the PAPA.

2.4.2.4 Alternative C

Alternative C is similar to the Proposed Action in number of wells, drilling rigs, number of new well pads, and includes:

- all project components described for the Proposed Action;
- the transportation corridors, gas sales pipelines and Granger Gas Processing Plant expansion;
- the development procedures for wellfield activities (Appendix C) and pipeline construction (Appendix D);
- a total of 4,399 wells drilled by the end of 2023;
- a peak of 48 drillings rigs operating in the PAPA, leveling off to 45 rigs after 2010;
- most drilling rigs with Tier 2 equivalent emissions by 2010; and
- installation of liquids gathering system in the southern portion of the PAPA.

Although Alternative C is similar to the Proposed Action in that it includes the same project components, it is different from the Proposed Action, geographically. That is, rather than only specifying certain areas of development where year-round drilling could occur, Alternative C specifies areas where year-round drilling would not occur. It includes a core area boundary that is different from the Proposed Action. The overall objective of Alternative C is to control spatial

disturbance over time maximizing development in some areas while minimizing development in other areas, especially in portions of big game crucial winter ranges. BLM has developed Performance-Based Objectives, which would apply to Alternative C (Appendix E). For each objective, the performance, or outcome, is the basis for judging the effectiveness of whatever measure is actually implemented. If the outcome is achieved, then the objective is met.

The Proposed Action Alternative Core Area was defined by the Operators and was based on the success of development to date and projections for success in future development. The Alternative C Core Area is based on BLM's Reservoir Management Group (RMG) projections for potential development in the PAPA (see Map 2.4-4). The USGS (Crockett et al., 2003) has defined "Very High Potential Areas", "High Potential Areas", "Moderate Potential Areas" and "Low Potential Areas" for development of the Pinedale Anticline as follows:

- Very High Potential Area – defined as a 1.5-mile wide band lying on the Pinedale Anticline axis including all acres 1 mile east and 0.5 mile west of the anticlinal axis with a northwest and southeast limit. This area would include over 500 additional wells per township (approximately 36 square miles).
- High Potential Area – defined as a 3-mile wide band lying on the Pinedale Anticline axis including all acres 2 miles east and 1 mile west of the anticlinal axis with a northwest and southeast limit. This area would include 100 to 500 additional wells per township.
- Moderate Potential Area – defined as a 5-mile wide band lying on the Pinedale Anticline axis including all acres 3 miles east and 2 miles west of the anticlinal axis with a northwest and southeast limit. This area would include 20 to 100 additional wells.
- Low Potential Area – includes all other areas in the PAPA and beyond. This area would include fewer than 20 additional wells per township.

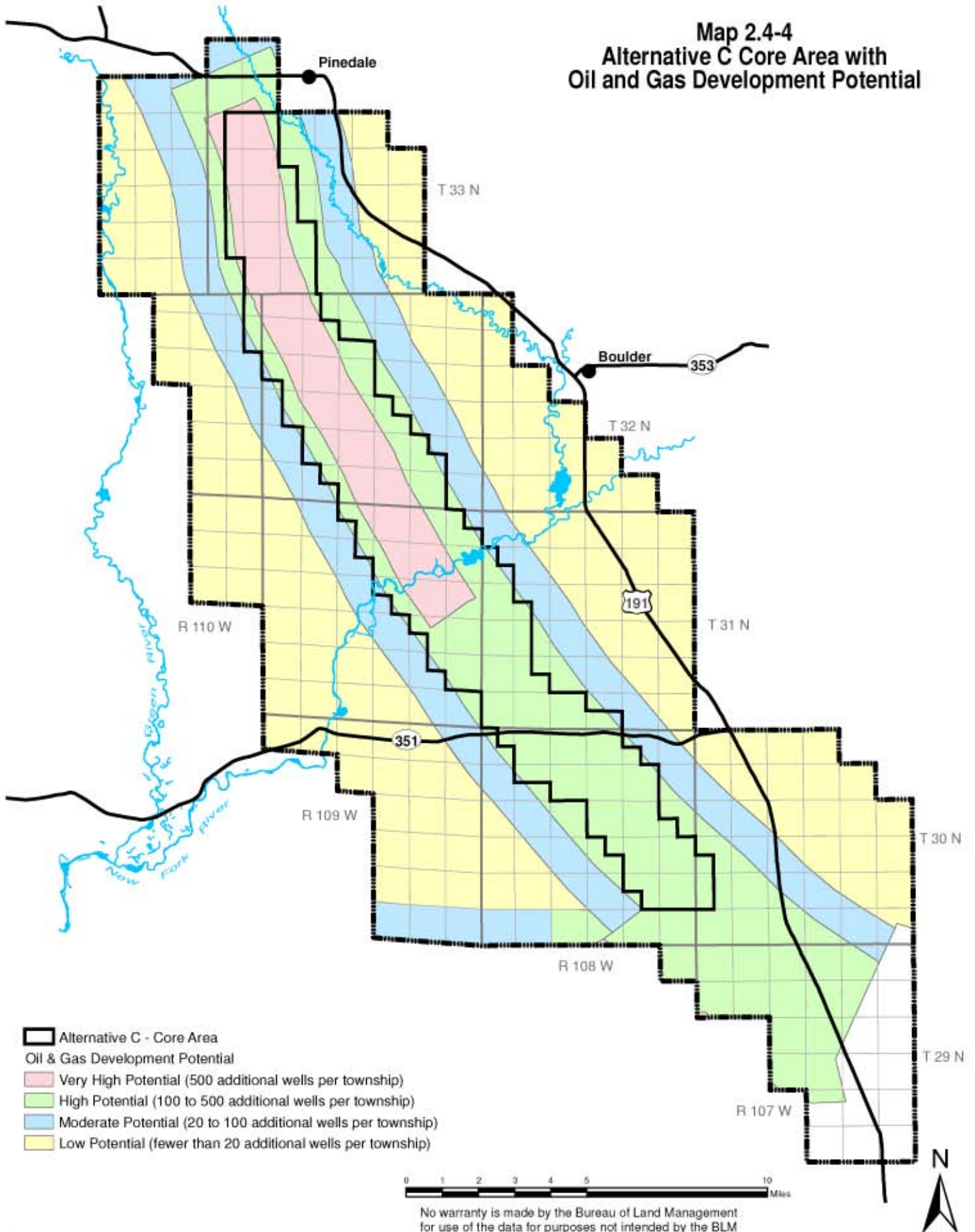
The Very High, High, Moderate, and Low potential areas are shown in Map 2.4-4. For Alternative C, the core area is defined as the Very High and High potential areas. Approximately 39,678.3 acres (62.0 square miles) are included in the Alternative C Core Area. This area is 20 percent of the PAPA and is smaller than the Proposed Action Alternative Core Area (22 percent of the PAPA).

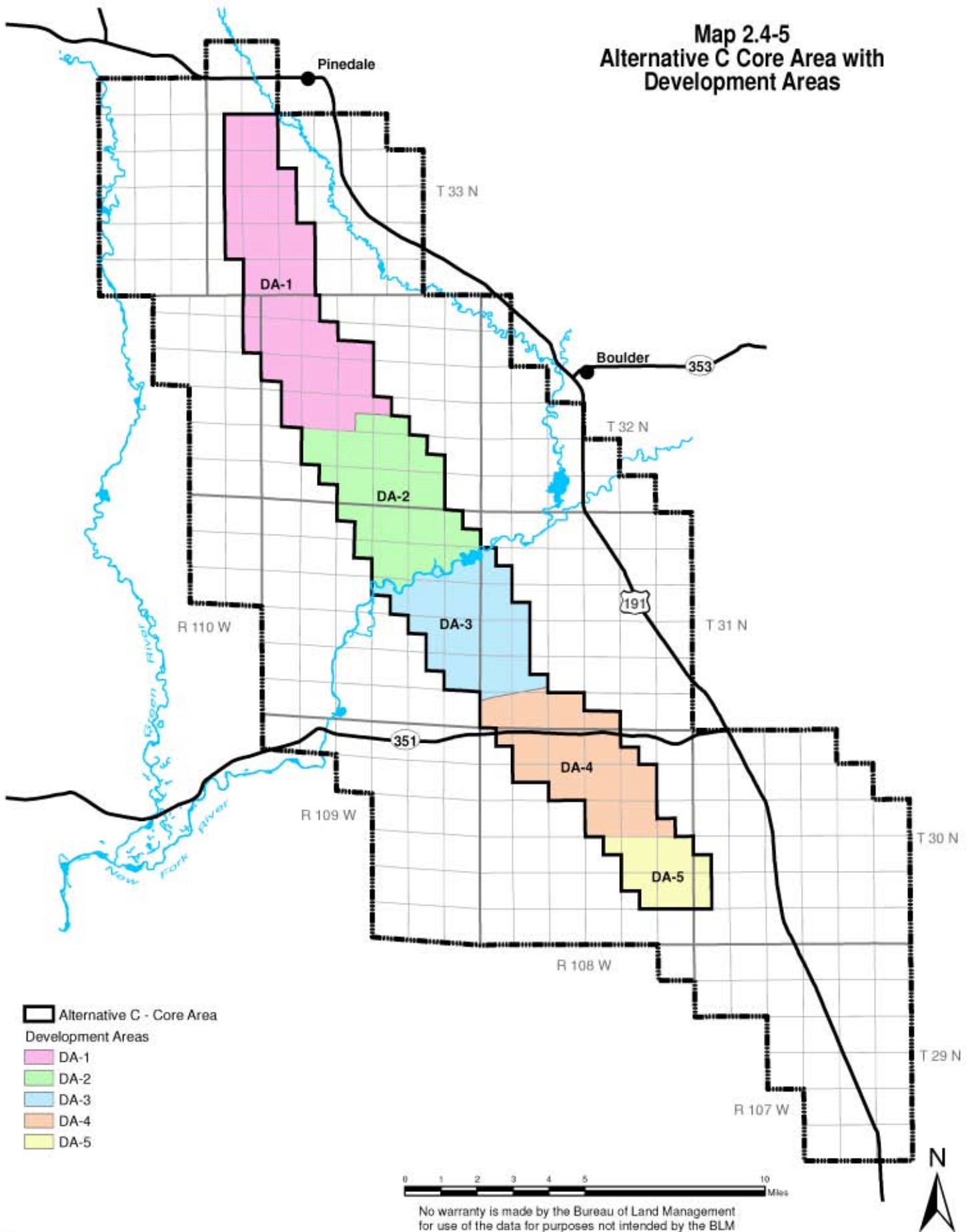
Alternative C includes five Development Areas (DAs) where there would be temporary relaxation of seasonal wildlife stipulations (see Map 2.4-5). For year-round drilling operations, In all development areas except for DA-5, Operators would be required to fully develop each existing and/or new well pad in one continuous time span for as long as necessary to drill and complete all wells on the pad. Once an Operator has determined that a well pad has been fully developed, they would not be allowed to reinitiate development on the well pad. Once a well pad has been fully developed, full site restoration and reclamation would begin as soon as the ground is not frozen and would be completed before the onset of winter. These elements of Alternative C would not apply in DA-5 because Operators would not be able to fully develop well pads due to timing and geographical constraints related to greater sage-grouse breeding and nesting habitats.

Seasonal wildlife stipulations would apply to new surface disturbing activities in all areas outside of the Alternative C Core Area. Development activities would be allowed in all DAs and outside of the Core Area at any time under the restriction of seasonal timing stipulations. Under Alternative C, the need for exceptions to seasonal wildlife stipulations would be greatly reduced.

In all areas of the PAPA, Operators would be required to expand existing well pads before constructing new well pads. Operators would be allowed to develop from all existing well pads

Map 2.4-4
Alternative C Core Area with
Oil and Gas Development Potential





within a quarter-section. If there are no existing well pads within a quarter-section, Operators would be allowed to develop one new well pad. Additional well pads in the quarter-section may be considered by BLM on case by case basis. Most new producing wells would be required to be connected to a liquids gathering system. Outside of the seasonally restricted periods, Operators would not be required to completely develop pads and could return to the pad in following years.

Operators would be required to comply with BLM's Performance Based Objectives that would apply to Alternative C (Appendix E) to fully stabilize sites immediately. Each DA has specific requirements for development as follows:

- DA-1 – this is the northern-most DA, includes mostly contiguous leaseholds, is entirely within big game crucial winter ranges (see Map 2.4-6), and overlaps portions of 2-mile buffers associated with several greater sage-grouse leks (see Map 2.4-7). The southern boundary of DA-1 is the approximate boundary of the mostly contiguous leases to the north (see Map 1.1-2 in Chapter 1) and the checkerboard patterned leases to the south (DA-2). The east-west boundaries of DA-1 are defined by the Alternative C Core Area (see Map 2.4-5). Year-round drilling and completions with temporary relaxation of seasonal wildlife stipulations (big game crucial winter range and greater sage-grouse breeding and nesting habitats) would be allowed within DA-1 with specific limitations.

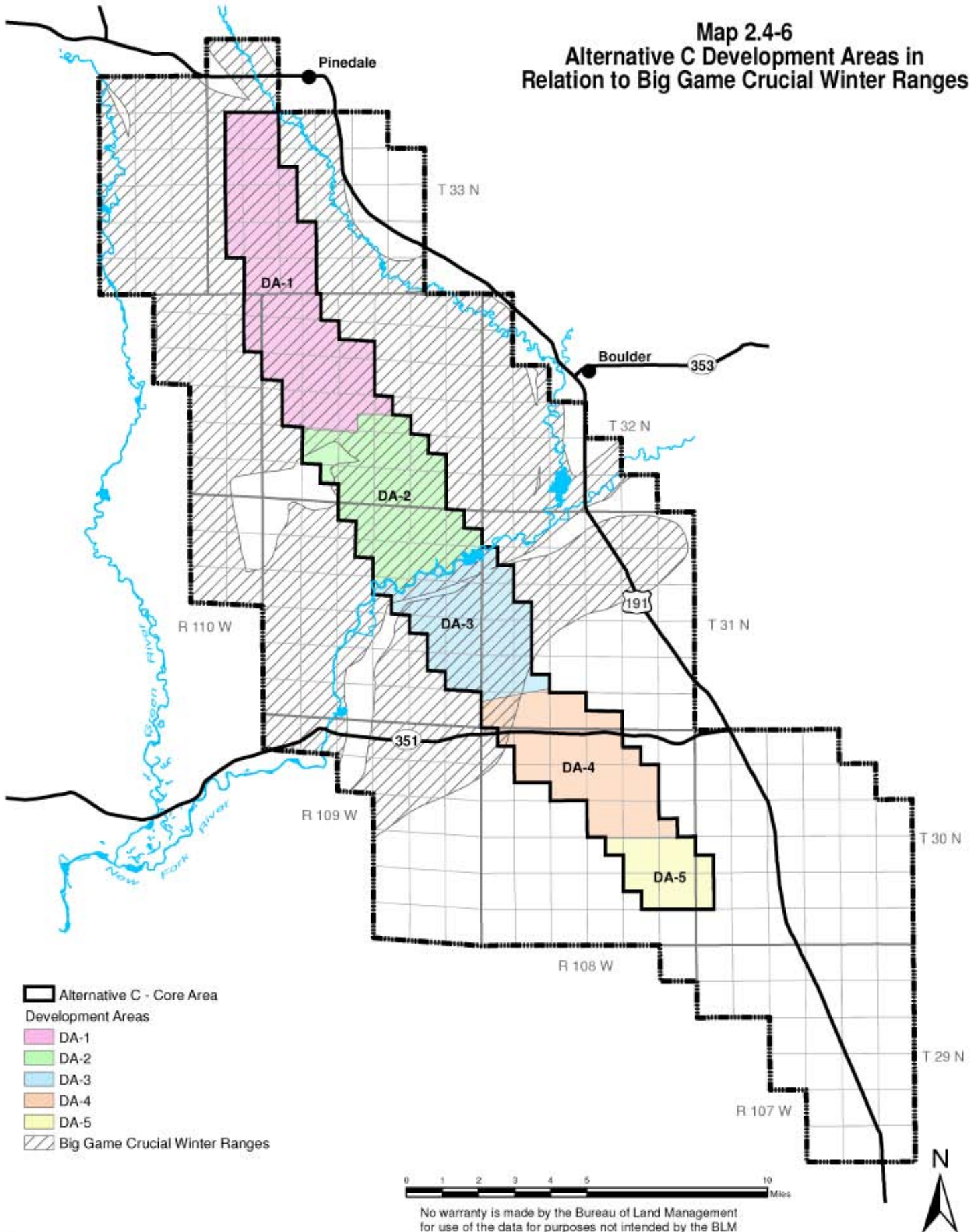
Initial (2007) year-round drilling would be restricted to a 2-mile wide area (south to north) beginning at the southern boundary of DA-1. As initial development is completed, the 2-mile wide area would move north. Development activities would not be able to advance to the north until the southern initial development is completed and final reclamation measures have been initiated. As development moves to the north, year-round activities would continue to be confined to within a 2-mile wide south to north zone. It is assumed that by the time the 2-mile wide drilling area reaches the northern-most portion of DA-1, the southern-most portion would have achieved a self-replicating vegetative community functioning at a pre-disturbance level. The pattern of development moving north while reclamation is initiated to the south would continue until DA-1 is fully developed. Once final reclamation has been initiated, no new development would occur in the areas to the south of the ongoing development.

Development activities could occur in all areas of DA-1 outside of the seasonally restricted periods except for areas that have been fully developed. Such development could include expansion of existing pads, construction of new consolidated pads, single well delineation pads, roads, and gathering pipelines.

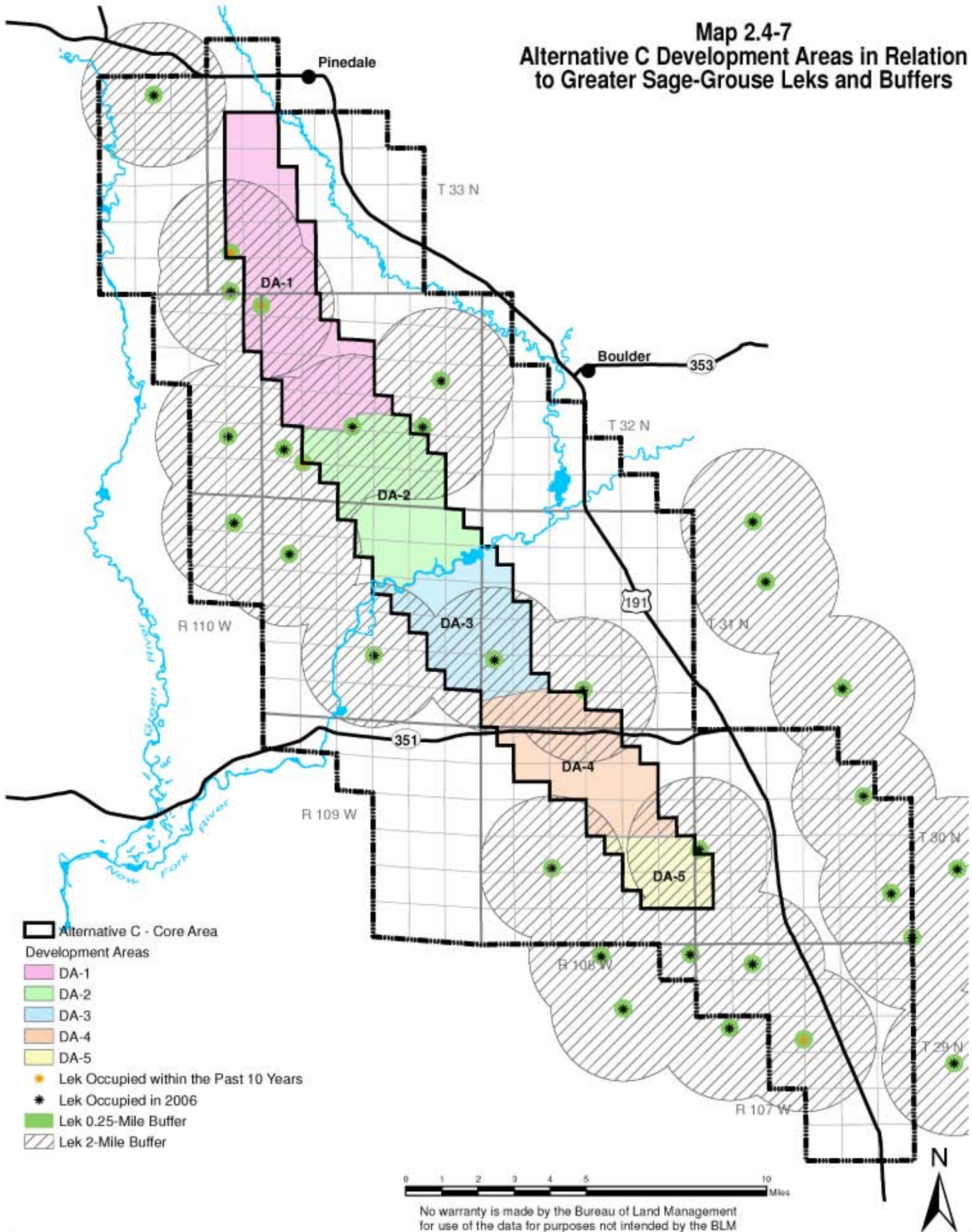
- DA-2 – this is located north of the New Fork River in the central portion of the PAPA, is mostly within big game crucial winter ranges (see Map 2.4-6), and overlaps portions of 2-mile buffers associated with several greater sage-grouse leks (see Map 2.4-7). The northern boundary of DA-2 is the southern boundary of DA-1 (see Map 2.4-6). The southern boundary of DA-2 is the New Fork River. The east-west boundaries of DA-2 are defined by the Alternative C Core Area. Year-round drilling and completions with temporary relaxation of seasonal wildlife stipulations (big game crucial winter range and greater sage-grouse breeding and nesting habitats) would be allowed within DA-2 with specific limitations.

Year-round development activities would be allowed to occur within all areas of DA-2 beginning in 2007 and lasting until DA-2 is entirely developed. Once DA-2 is entirely developed, no new surface disturbance or drilling would be allowed to occur during any season for the remaining life of the project.

Map 2.4-6
Alternative C Development Areas in
Relation to Big Game Crucial Winter Ranges



Map 2.4-7
Alternative C Development Areas in Relation
to Greater Sage-Grouse Leks and Buffers



- DA-3 – this is located south of the New Fork River in the central portion of the PAPA and is mostly within big game crucial winter ranges (see Map 2.4-6). The northern boundary of DA-3 is the New Fork River and the southern boundary is the southern border of the 0.25-mile buffer on the Lander Trail. East-west boundaries of DA-3 are defined by the Alternative C Core Area.

Year-round drilling and completions would be allowed to occur within all areas of DA-3. However, year-round drilling would not begin in DA-3 until all development activities (drilling and completions) are completed in DA-2. Development activities could occur in all areas of DA-3 outside of the seasonally restricted periods beginning in 2007.

- DA-4 – this is located in the southern portion of the PAPA. There is a small portion of big game crucial winter ranges that coincide with DA-4 (see Map 2.4-6) and the majority of DA-4 is within 2 miles of several greater sage-grouse leks (see Map 2.4-7). The northern boundary of DA-4 is the southern border of the 0.25-mile buffer on the Lander Trail. The southern boundary of DA-4 was defined by the BLM ID Team to be approximately 1.0 mile from the nearest greater sage-grouse lek that is associated with the Yellowpoint Lek Complex. The boundary is defined by Sections 13, 14, and 15 to the north and Sections 22, 23, and 24 to the south, all of which are in T. 30 N., R. 108 E. East-west boundaries of DA-4 are defined by the Alternative C Core Area.

Year-round drilling and completions would be allowed within all areas of DA-4 beginning in 2007 and lasting until DA-4 is entirely developed. BLM would temporarily relax stipulations that would otherwise protect greater sage-grouse leks and greater sage-grouse nesting habitat. Once DA-4 is entirely developed, no new surface disturbance or drilling would be allowed to occur.

- DA-5 – this southernmost DA extends south from the border with DA-4. All of DA-5 is within 2 miles of at least one greater sage-grouse lek in the Yellowpoint Lek Complex (see Map 2.4-7). None of DA-5 coincides with big game crucial winter ranges (see Map 2.4-6). The southern boundary of DA-5 is the northern boundary of the Jonah Field Project Area. East-west boundaries of DA-5 are defined by the Alternative C Core Area. Drilling and completions would comply with the stipulations to protect greater sage-grouse leks and nesting habitat.

Proposed project components and estimates of initial and LOP disturbance under Alternative C are provided in Tables 2.4-11 and 2.4-12 for development through 2011 and 2023, respectively. The initial disturbance under Alternative C through 2011 is estimated to be 6,856.6 acres, with a LOP disturbance of 2,069.0 acres. Through 2023, the initial disturbance is estimated to be 12,271.6 acres with a LOP disturbance of 4,095.6 acres.

The estimates used under Alternative C, including the number of wells to be drilled, the number of drilling rigs required, the volume of associated traffic and the size of the required workforce, are the same as those described for the Proposed Action Alternative.

Table 2.4-11
Proposed Project Components and Estimated Initial and Life of Project
Disturbance under Alternative C through 2011

Component	Number or Miles	Total (acres)	LOP Disturbance (acres)
Well Pads, Roads and Gas Gathering Pipelines			
Well Pads ¹	179 wells	3,427.0	1,370.8
Local and Resource Roads ²	89.3 miles	541.5	433.2
Gas Gathering Pipelines ³	87.1 miles	527.9	0.0
Liquid Gathering Pipelines	236.3 miles	1,432.8	0.0
Subtotal		5,929.2	1,804.0
Trunk Pipelines and Ancillary Facilities ⁵		927.4	265.0
Total – Wellfield Components		6,856.6	2,069.0
¹ Disturbance includes new well pads and expansion of existing well pads. LOP disturbance assumes 60 percent reclamation of well pads. ² Assumes no new collector roads would be built within the PAPA, estimate for miles of proposed roads based on factors determined from existing roads. LOP disturbance assumes 20 percent reclamation of roads. ³ Estimate for miles of proposed gas gathering pipelines based on factors determined from existing roads. ⁴ Estimate for miles of proposed liquid gathering pipelines are based on data provided by QGM, Shell and Ultra. ⁵ Detail for trunk pipelines and ancillary facilities is described in Table 2.4-8 for the Proposed Action Alternative 2011.			

Table 2.4-12
Proposed Project Components and Estimated Total and Life of Project)
Disturbance under Alternative C through 2023

Component	Number or Miles	Total (acres)	LOP Disturbance (acres)
Well Pads, Roads and Gas Gathering Pipelines			
Well Pads ¹	250 pads	8,112.0	3244.8
Local and Resource Roads ²	120.8 miles	732.2	585.8
Gas Gathering Pipelines ³	117.5 miles	712.0	0.0
Liquid Gathering Pipelines	295 miles	1,788.0	0.0
Subtotal		11,344.2	3,830.6
Trunk Pipelines and Ancillary Facilities ⁵		927.4	265.0
Total Wellfield Components		12,271.6	4,095.6
¹ Disturbance includes new well pads and expansion of existing well pads. LOP disturbance assumes 60 percent reclamation of well pads. ² Assumes no new collector roads would be built within the PAPA, estimate for miles of proposed roads based on factors determined from existing roads. LOP disturbance assumes 20 percent reclamation of roads. ³ Estimate for miles of proposed gas gathering pipelines based on factors determined from existing roads. ⁴ Estimate for miles of proposed liquid gathering pipelines are based on data provided by QGM, Shell and Ultra. ⁵ Detail for trunk pipelines and ancillary facilities is described in Table 2.4-8 for the Proposed Action Alternative 2011.			

2.4.2.5 Summary of Surface Disturbance for Alternatives Analyzed in Detail

A comparison of the alternatives is provided in Table 2.4-13 showing estimates of initial and LOP disturbance for each of the alternatives. LOP disturbance is the amount of disturbance remaining once development is complete. A comparison of impacts to each resource for all alternatives analyzed in detail is provided in Appendix F.

Table 2.4-13
Summary of Surface Disturbance for Alternatives Analyzed in Detail

Project Component	Total Number, Area (acres), or Length (miles) of Component				
	Alternative A No Action (2011)	Alternative B Proposed Action (2011)	Alternative C (2011)	Alternative B Proposed Action (2023)	Alternative C (2023)
New Well Pads	245	179	179	250	250
Initial Surface Disturbance (all wellfield components - acres)	4,484.5	6,845.0	6,856.6	12,278.4	12,271.6
LOP Acres Surface Disturbance (all wellfield components – acres)	1,314.5	2,065.8	2,069.0	4,093.3	4,095.6
Initial Surface Disturbance (Well pads, roads and gathering pipelines – acres)	3,890.3	5,917.6	5,929.2	11,351.0	11,344.2
LOP Surface Disturbance (Well pads, roads and gas gathering pipelines – acres)	1,179.5	1,800.8	1,804.0	3,828.3	3,830.6
Initial Surface Disturbance Other Components (acres)	594.2	927.4	927.4	927.4	927.4
LOP Surface Disturbance Other Components – acres	135.0	265.0	265.0	265.0	265.0
Miles of Local and Resource Roads	108.0	88.7	89.3	120.8	120.8
Miles of Gas Gathering Pipelines	105.6	93.1	87.1	118.6	117.5
Miles of Liquid Gathering Pipeline	6.0	235.8	236.3	295.0	295.0
Number of Wells Drilled	1,139	1,453	1,453	4,399	4,399
LOP=life of project					

2.4.3 Alternatives Considered but not Analyzed in Detail

2.4.3.1 Conservation Alternative

The Conservation Alternative would be similar to the No Action Alternative but would require additional mitigation. All seasonal wildlife restrictions would apply and there would be no exceptions allowed. All Operators would be required to use liquid gathering systems for transport of condensate and produced water to central gathering facilities. No new pads would be allowed in a quarter-section (approximately 160 acres) if there are one or more existing pads. Operators would be required to expand existing pads unless there are topographical constraints. Operators would be required to drill out a quarter-section before moving to another area and would not be allowed to return. No more than four well pads per section would be allowed. Operators would be required to have Tier 2 equivalent emission controls on all drilling rigs within the PAPA, and all completions would be required to be “green” (recover most of the production rather than flaring it all). This alternative was not analyzed in detail for the following reasons:

- The use of Tier 2 equivalent emissions on drilling rigs requires that existing rigs either be retrofitted or that new drilling rig engines be built with these emission controls. If all

seasonal wildlife restrictions are in effect, Operators are not able to keep drilling rigs through the winter and there is no guarantee that they could get the same drilling rigs (with the controls) back to the PAPA for the spring/summer/fall drilling. This is especially true currently, because drilling rigs are difficult to obtain. Therefore, a more stable drilling rig fleet is necessary for Operators to have emission controls on all drilling rigs. A stable drilling fleet would allow the Operators to use natural gas-fired drilling rigs. This alternative would not allow any relaxation of winter stipulations to enable drilling rigs to stay in the PAPA year-round.

- Although in most cases, Operators would be able to develop the resource on four well pads per section (one well pad per quarter section); in some locations it would not be possible due to topographical constraints or resource constraints. In these locations, more well pads could be required to avoid steep slopes, sensitive soils, greater sage-grouse leks, bald eagle nests, etc.
- Most completion operations in the PAPA are green as specified in the Operators' WDEQ permits. It is unreasonable to expect that all completions be "green" because of safety issues or location (insufficient production pressure).
- The Operators have proposed a long-term development plan for the PAPA which includes a liquids gathering system. Due to the location of leaseholds, the number of wells to be drilled per location, and the request for access in wildlife timing stipulation areas, it is unreasonable to require that all operators be connected to the liquids gathering system for all locations.

2.4.3.2 Maximum Development Alternative

A Maximum Development Alternative was considered but not analyzed in detail. This alternative would include development of natural gas resources by wells with 5-acre bottom hole spacing from the Lance Formation and development of the deeper Rock Spring Formation natural gas resource as yet undefined, on 160-acre bottom hole spacing. This development level would be allowed year-round within a core area flanking the Anticline Crest (where there is maximum potential for development) and would extend to an additional 0.5 mile distance from the core area. If the development would expand beyond the core area and reach a density of two well pads per section, then that would become part of the core area. None of the seasonal wildlife stipulations would apply to the core area. Exceptions would be allowed outside of the core area. There would be no requirement for Tier 2 equivalent emissions control on drilling rig engines. This alternative was considered but not analyzed in detail for the following reasons:

- this alternative would have no provisions for Tier 2 equivalent emissions on drilling rigs. Previous air quality impact analysis (BLM, 2006a) has shown that at least some control of drilling rig emissions is required for this level of development due to the proximity of the PAPA to the Bridger Wilderness Area; and
- under this alternative, there would be no provision for consolidating development to allow for areas with no drilling activity during seasonal timing restrictions along the Anticline Crest.

2.4.3.3 Reduced Pace of Development Alternative

A Reduced Pace of Development Alternative would include all of the elements of the Proposed Action but would require that the resource be developed over a longer period. This alternative was considered but not analyzed in detail for the following reasons:

- the No Action Alternative has the elements of a reduced pace of development, due to the seasonal wildlife stipulations. Although subsequent Decision Records (BLM, 2004a,

2005a, 2005b, and 2005c) have allowed for increased winter drilling, comparison of the No Action Alternative to the Proposed Action Alternative shows that there is still an element of reduced pace of development in the No Action Alternative. For the most part, seasonal wildlife stipulations would still be in effect;

- a reduced pace of development would increase the overall period for development of natural gas resources in the PAPA; and
- a reduced pace of development would not be in keeping with the Energy Policy Act of 2005 which emphasizes the development of domestic natural gas reserves for supply and economic stability.

2.4.3.4 Alternative Pipeline Corridor and Sales Pipeline Alignment

An alternative route for BCC, R6 Pipeline (Segment 1) and the PBC Pipeline was initially considered. The alternative route deviated from the proposed route at approximate milepost 12.1 and returned to the proposed route at milepost 17.1 (see Map 2.4-2). The 6.4-mile long segment would replace 5.0 miles of the proposed route. The alternative route was considered but not analyzed in detail for the following reasons:

- a 500-foot corridor would be required for two large diameter pipelines with 120-foot construction rights-of-way, which is unavailable along the alternative route;
- there is one greater sage-grouse lek within 0.25 mile, and one lek within 2 miles, of the alternative alignment and there would have been seasonal restrictions on pipeline construction;
- the length of the alternative pipeline segment between the two points of deviation was longer than the proposed route's segment; therefore there would be less surface disturbance to vegetation, soils, and wildlife habitat, and overall, less environmental impact, in general, by using the proposed route; and
- there are fewer sensitive cultural resources along the proposed route in comparison to the alternative route.